The Infantry School

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PREFACE

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CHAPTER 1

From Flintlock to M-1

(A REVIEW OF U. S. INFANTRY SHOULDER WEAPONS)

The common ancestor of U. S. Army flintlock muskets was the Charleville musket, made in France at the Imperial Armory located at Charleville, and furnished to the Continental Army by the French Government and private firms during the American Revolution.

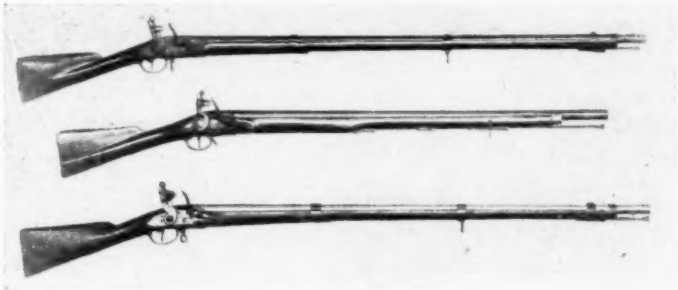


FIGURE 1.

Top to bottom—
Charleville Flintlock Musket, Model 1763.
British "Brown Bess" Flintlock Musket.
U. S. Springfield Flintlock Musket, Model 1808.

This musket, prior to 1776, had gained for itself the reputation of being the best infantry weapon of its kind in Europe. There were several reasons for this superiority; the musket was manufactured under strict government supervision; in design, it departed from the heavy cumbersome weapon usually associated with the period; its lock was finely made and functioned smoothly; and the barrel,

although a "smooth-bore," i.e., without rifling, did, due to precision in its manufacture, possess some accuracy.

At the beginning of the American Revolution, the shoulder weapons of the colonial troops were of necessity a mixed lot. Prominent among the types in use were the "Brown Bess," a British Army musket that had seen service in the French and Indian War, and the hunting musket, familiarly known as a "fowling piece." There was also a limited supply of locally made "Committee of Safety" muskets furnished the "Minute Men" and militia. These pieces, fabricated by the colonial gunsmiths in defiance of British authorities, were not made from any definite pattern, but in general resembled the "Brown Bess." Very few of these weapons were marked. This, of course, was due to the circumstances governing their manufacture.

Lafayette, assuming that an acute shortage of weapons existed in the ranks of the patriots, brought with him to America a few Charleville muskets for the Continentals. Soon, thousands of these weapons (made at Charleville, Maubeuge, and St. Etienne) reached America. They were destined to become the outstanding infantry weapon used in the Revolutionary War. Indeed, in the hands of the ragged, half-fed troops of the Continental Line they were to write the history of that struggle at Trenton, Saratoga, and Yorktown.

At the close of the war, the army was disbanded, and many of the unpaid soldiers were allowed to take home their muskets as mementos of their service. The many muskets turned in or still on hand were stored at the military stations then in existence at West Point, Springfield, Pittsburg, Carlisle, and Philadelphia, where the old veterans were to remain until the War of 1812, when they were withdrawn from their long storage and used to help arm the militia. Not only did the Charleville musket perform distinguished war service, but it also served as the pattern for the first Springfield flintlock musket.

The Springfield Armory was established at Springfield, Massachusetts in 1795 for the manufacture of weapons for

the small regular army and the militia of the fledgling republic. This was the first national armory authorized by Act of Congress. In 1795, the manufacturing of weapons was a slow and tedious process. "Assembly line" production and interchangeable parts were unknown. Each musket was made individually; the locks were filed by hand; and the expert "filer" could turn out an average of less than one a day. Barrels, stocks, and furniture were made by the same process. By such laborious methods, a total of 245 muskets were produced during the first year of operation. The Model 1795 was continued as the regulation weapon of the army and militia until 1808. It is of interest to note that during this period a total of 40,590 Model 1795 muskets were manufactured at Springfield.

FIGURE 2.—Springfield Flintlock Musket, Model 1795, the first arm fabricated at Springfield Armory.

In addition to the weapons made at Springfield, many thousands of muskets, patterned after the Model 1795, were manufactured by private contractors. In 1798, contracts were let with these people. The government advanced funds in some cases so that factories could be built and production started. Among these contractors were: D. Gilbert, Massachusetts; J. McCormick, Pennsylvania; E. Stillman, Connecticut; A. Bartlett, Massachusetts, and Eli Whitney, Connecticut. Most prominent of this group was Eli Whitney; for while his fame rests mainly on the invention of the cotton gin, he was one of the noted armorers of his time. From the date of his first contract in 1798 until his death in 1825, he was engaged in the manufacture of arms for the United States. The inventive genius of Whitney shone in his muskets; he advocated and used improvements years before they were finally adopted by the government armories. The

Whitney Armory continued in operation until after the Civil War.

George C. Maynard of the National Museum says of Whitney: "He fulfilled all his contracts, repaid the money advanced by the government, and established what was declared to be the most perfect and complete gun factory in the United States. Officers of the army placed on record the opinion that the manufacture of satisfactory military arms was due more to Whitney than to any other individual in this country."

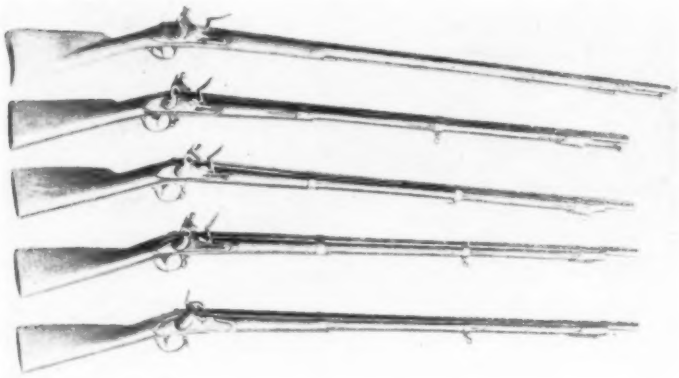


FIGURE 3.

Top to bottom—

Committee of Safety Flintlock Musket, period 1775, made by private gunsmiths to arm the militia.

U. S. Flintlock Musket of unknown maker, period of Revolutionary War, or War of 1812.

U. S. Flintlock Musket marked "Virginia Manufactory".

U. S. Springfield Flintlock Musket, dated 1819.

U. S. Flintlock Musket dated 1831, New Haven, made by Eli Whitney, converted to percussion and issued during the Civil War.

Harper's Ferry Armory was established in 1796 and destroyed by fire (as a war measure) in 1861. This armory in Virginia was destined not only to become the manufactory of weapons that gained universal acclaim, but also to

become the historical setting wherein appeared John Brown, Colonel Robert E. Lee, and Lieutenant J. E. B. Stuart in a scene that was the prelude to a four-year drama of Civil War. Operating contemporaneously with the Springfield Armory (after 1800), the Harper's Ferry Armory produced the Model 1795 muskets on a small scale. During the period 1801-1807, 3,155 of these weapons were made at this armory.

The Model 1808 musket differed slightly from that of 1795. Changes were made in the buttstock, the lock plate, the trigger guard, the band springs, and the sling swivels; the brass flash-pan was also introduced in the later issues of this model. This weapon was the regulation infantry musket used, along with earlier models, by the American troops during the War of 1812.

Shortly after this war, Captain John Hall, who was to revolutionize the entire process of American ordnance manufacture, reported for duty at Harper's Ferry in connection with the production of his patent breech-loading, flintlock rifle, which was the first successful breech-loading weapon adopted by the United States. His use of the principle of interchangeable parts was his greatest contribution to the armorer's art.

Contemporary with the Springfield and Harper's Ferry Armories and the many contractors, was the Virginia Manufactory, established at Richmond, Virginia, in 1797 for the purpose of producing weapons for the Virginia militia. (It is interesting to note that the principle of States Rights then included the privilege of the several states to make their own weapons. South Carolina many years later upheld this tradition by the establishment of the famous Palmetto Armory.) The Virginia Manufactory continued in operation until the close of the War Between The States. In general, the muskets produced at Richmond conformed to the patterns and specifications of the national armories at Springfield and Harper's Ferry.

The Model 1822 flintlock musket departed somewhat radically from the design of 1808. The most striking departure was in the peculiar shape of the buttstock; no comb was provided. The hammer was made with a rounded face, and the brass flash pan was equipped with a fence of the slanting type (after Whitney's ideas). These weapons were used in the army until the various units were equipped with the Model 1842, the first percussion musket to be manufactured.

FIGURE 4.—U. S. Flintlock Musket, Harper's Ferry, Model 1822.

The Mexican War (1846-1848) was fought mainly with flintlocks, although at this time the Model 1841 U. S. Rifle (percussion) made its appearance in the hands of the Mississippi troops. It might be stated here that the flintlock musket was almost as efficient as the percussion musket. The main objection to the flintlock was its inability to function properly in the rain. The use of the percussion cap overcame this difficulty. Whereas the flint could be used for about sixty shots, a new cap was necessary for each firing of a percussion musket. An army without percussion caps for the new weapon was helpless, while one with the old flintlocks could protect itself as long as each man had one or two good flints and an ample supply of powder and ball.

Incidentally, army orders were very strict about the men snapping their muskets and wasting sparks from the flint. In order to go through the twelve regulation motions necessary to load and fire a flintlock musket for drill purposes, [1] a wood "flint", called a "snapper", was substituted for

[1] One of the motions was to bite the paper cartridge so that powder could be poured into the pan. At this time recruits accepted by the army were required to have very strong front teeth. Men desiring to avoid military service sometimes knocked out two or three of their front teeth.

the usual piece of flint. The soldier could thus snap his piece without wasting valuable sparks. Dummy bullets in the form of clay balls were, no doubt, used to give the early infantry soldier practice in loading his musket. These were rammed down the barrel during drill and removed afterward by crushing with the ramrod, a much simpler procedure than the use of the worm screw which had to be employed to withdraw an unfired service cartridge and lead ball. [2] The above theory is advanced by the author after finding many clay balls, caliber .69, on the site of old Fort Atkinson, Nebraska (then Missouri Territory) which was garrisoned by the 6th U. S. Infantry from 1819 to 1827. The Model 1842 percussion musket was furnished to the army only in limited quantities, much to the delight of the old soldiers, who preferred the flintlock for its simplicity.

It should be noted that definite dates cannot be determined as to when the manufacture of one model ceased and the production of a new model commenced. For purposes of general comparison the totals of the years between models were used as a basis. From 1795 to 1844, Springfield Armory produced a total of 485,262 flintlock muskets. Harper's Ferry, from 1801 to 1844, manufactured a total of 336,619 of the same weapons. This tremendous production of arms, during early decades of the Republic, was an achievement due mainly to American industry and ability coupled with the sound advice of Washington, who early saw the need for the United States to be adequately armed.

Today the U. S. Flintlock musket is a rare item. Thousands of the earlier muskets were sold at auction to clear the arsenal store rooms (weapons that had followed the stars of Washington and Anthony Wayne were sold for a mere pittance); other thousands were purchased by American traders for use in their trade with the natives of Africa and the Orient (where today the flintlock is still in use).

[2] Due to the difficulty in removing the unfired load from a musket or rifle, the old guard, upon its relief, discharged its weapons at a target set up in the vicinity of the guard house. The commanding officer customarily granted an extra pass to the soldier whose shot scored highest.

Hundreds of thousands of the later flintlock muskets were converted to percussion-cap weapons and used to arm the volunteers in the Union Army at the outbreak of the Civil War. Muskets in storage in the South were utilized by the Confederate Army. After the war, thousands of these old history-makers were sold at auction and broken up for their metal by those who did not appreciate their historic and sentimental value. Many of these converted flintlocks were carried home by the discharged soldiers, perhaps to hang in a place of honor while the veterans lived and later to rust and disintegrate in some old barn or shed, neglected and forgotten by all except the arms student.

From the Revolution until the Civil War, the army was furnished mainly with smooth-bore muskets. These weapons were effective for military firing as it was done then—volley fire at close ranges into massed bodies of the enemy in parade ground formation.

Contemporary with the smooth-bore musket of the period mentioned above, was the *rifle* of the civilian hunter and pioneer. When the backwoodsman came into the settlements to join the army, he brought his rifle and used it throughout a campaign. At single targets at great distances, the rifle could not be surpassed for accuracy and shock-action. In the hands of the backwoodsmen led by Daniel Morgan, Daniel Boone, and others, the rifle gained a legendary reputation for accuracy. However, until its effectiveness demonstrated its superiority over the smooth-bore musket, the rifle was considered by military authorities to be primarily a civilian weapon. Due to the tactics of those days, the rifle did not quite belong to the weapon group which had for its mission the delivery of unaimed mass fire. The rifle was an individual weapon to be carefully and skillfully loaded, and patiently and methodically aimed and fired at single targets, at long ranges. The riflemen, therefore, could not adapt himself to the military way of firing, yet, when engaged in battle, the results obtained clearly proved that he and his weapon were superior to the infantry soldier and his musket. The rifle was prim-

arily a weapon of opportunity. Its most efficient use was against individual fleeting targets, and, for this reason, it was invaluable in the tree-to-tree combats of the early Indian Wars. The small caliber rifle ball, aided by its patch, when sent forth from the grooved barrel, went true to the mark with high velocity and penetrating power. Hence for many years, the rifleman was able to cope with the Indian (until the Red Man inaugurated mounted warfare.)

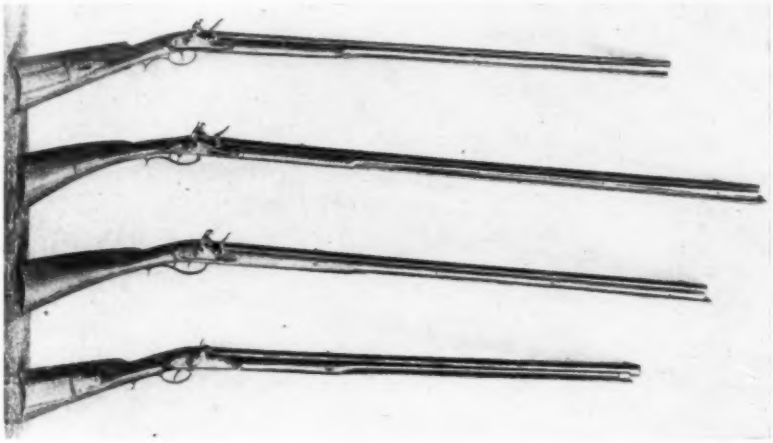


FIGURE 5.

Top to bottom—

Flintlock Kentucky Rifle by Mcll, gunsmith of Pennsylvania, 1800.

Flintlock Kentucky Rifle by Miller, gunsmith of Lancaster, Pennsylvania 1776—a typical long rifle.

Flintlock Kentucky Rifle by C. Bird & Co. of Philadelphia, period 1812.

Military type Kentucky Rifle (converted to percussion) period 1800-1812.

Famous among the early rifles is the Kentucky Rifle which should really be called the Pennsylvania Rifle, inasmuch as it was hand-made mainly by the Pennsylvania gun and riflesmiths. The term "Kentucky Rifle" seems to have originated from the fact that this weapon was made for and

carried by the pioneers going west over the mountains into Kentucky.

The use of the *rifle,* as a military weapon, did not become general until the American War for Independence. The distinction with which the rifle served throughout that conflict caused many tacticians to weigh its advantages with those of the smooth-bore regulation infantry musket. (Its secret was very simple; the patch). Rifling, spiral grooves cut in a gun barrel for the purpose of giving the bullet a twist or rotation as it leaves the weapon, makes for greater accuracy than does the smooth-bore out of which the bullet is pushed, much the same as one might push a plug. The first rifles were cumbersome affairs. The lead ball or bullet was pounded, with a hammer, down the rifling and seated on the powder charge. This was slow and very destructive to accuracy, as the bullet was considerably damaged during the procedure. Then one day some unsung genius laid a piece of greasy buckskin over the muzzle, placed the ball on this, and pushed the ball and the buckskin down the barrel until the top of the ball was even with the muzzle. The surplus buckskin was then cut off close to the muzzle, and the ball, wrapped in the patch, was pushed down the rifling to the powder charge with a ramrod. The ball did not touch the rifling; only the patch engaged the grooves. Upon the firing of the powder charge, the ball, surrounded by the patch, rode out, following the rifling. The patch, on reaching the muzzle, dropped off; the bullet sped on its way undamaged and ready for its mission. Patches were generally made of buckskin, linen, or muslin. They were prepared in tallow, or cut as needed and rubbed in a grease-filled patch box in the buttstock. Indeed, many expert pioneer riflemen scorned all but the saliva-soaked patch. (Saliva was a powder solvent which cleaned the bore on its downward path in the loading operation.)

The first *rifle* regiment was organized in 1808 and consisted of ten companies of eighty-four officers and men each, plus the necessary regimental field and staff officers.

The first rifle with which this unit was armed was produced at the Harper's Ferry Armory and has been termed the Model of 1803 by writers on early U. S. weapons. This most interesting shoulder arm was made at Harper's Ferry from 1804 to 1819. However, there is in existence a speciman of this weapon dated 1797. It is a strange combination of the Kentucky Rifle, the Hessian Jäger Rifle, and the French Army Carbine. Very few of the traditional musket lines appear in this weapon which, for the beauty of its design, is the outstanding rifle of early U. S. Army manufacture. The following is a description of the rifle: Total length 52 inches; barrel length 37 inches (sometimes 33 inches); caliber .54, with seven rifle grooves; half-stock of walnut;

FIGURE 6.—U. S. Flintlock Rifle, Model 1803-1814, the first regulation rifle made at Harper's Ferry 1817.

butt with a cheek piece; stock brass-trimmed with a patch box, which opened upon pressure on a stud in the heel of the butt. The lock was of the conventional flint type, with single trigger (some have been found with set triggers) and lock plate marked "Eagle, U. S. Harper's Ferry", and the date of manufacture. The weight was about 9¾ pounds. The powder charge was 90 to 100 grains of fine powder behind a ½-oz. lead ball patched with linen or buckskin. The muzzle velocity was about 2,000 feet per second. The ramrod was of steel. The rifle did not provide for the attachment of a bayonet, as the long-range fire of the rifleman was thought to make such an auxiliary weapon unnecessary. However, this theory was abandoned in the next model of the rifle, the Model of 1817 (common rifle) which was designed to take a bayonet.

Tradition has it that the first official use of this rifle was by the famous Lewis and Clark Expedition of 1804. The journal of the expedition records that Captain Lewis spent some time at Lancaster, Pennsylvania, where some of the hunting rifles were, no doubt, manufactured (probably by either Leman or Dickert of that place). These rifles may have been intended for the use of the hunters attached to the company. The rifles, tomahawks, and knives for the expedition were made at Harper's Ferry.

FIGURE 7.—German Jäger Rifle used by the Hessian troops during the American Revolution.

General Henry Dearborn, Secretary of War in 1806, made the following report to the Ninth Congress: "It would not be improper, moreover, to remark that the muskets and rifles manufactured at Harper's Ferry are superior in workmanship to any others intended for military purposes." However, the Harper's Ferry rifle did not approach the excellence of its contemporary, the "Kentucky," the main defect being the rifling. This inferiority was caused, no doubt, by the attempted mass production of the weapon. The Kentucky Rifle was the product of individual gunsmiths, who had the time and experience necessary to turn out pieces of superior craftsmanship for essentially nonmilitary purposes. The national armories were then just starting the production of rifles. Ordnance officers and craftsmen were learning the business of arms fabrication. That they were apt students is recorded in the story of American weapons. Eventually, the arms made at Harper's Ferry were to lead the world in excellence and military worth.

In addition to its distinguished service with the Lewis and Clark Expedition, the Harper's Ferry rifle saw action against the Barbary Pirates during the war with Tripoli; and in the War of 1812, at Ft. McHenry and at New Orleans, it rendered signal service alongside the Kentucky Rifle.

The Hall breech-loading, flintlock rifle must be considered when any mention is made of early U. S. rifles. Using his patented machinery and adopting the principle of manufacturing interchangeable parts, Captain John Hall, perhaps, exercised more influence over ordnance manufacture in this country than any other person. In order to give the reader some of the story of the inventor of this rifle, the following extracts are taken from the Report of the Committee on Military Affairs, dated February 24, 1836. 24th Congress, 1st Session, John H. Hall—H. R. No. 377.

"This description of arm was presented to the notice of the Government in 1813, by Mr. Hall, the inventor. The Secretary of War (then General Armstrong) ordered a few of them to be procured for trial. In 1816 samples were again presented, and in 1817 (January) a contract for 100 of them was made by direction of the Secretary of War, with a view of arming a company of riflemen with them, by way of experiment; these were completed in that year, and the officer who received and inspected them, made a favorable report on them. Mr. Hall was then directed to repair to one of the national armories, and attend to the construction of a few of these rifles with a view to improving their model, and to further experiment with them. Four arms were made and tried at the armory, the officers of which made a report of them in favorable terms. After these trials at the armory, the arms were submitted for examination and trial to a board of military officers, then assembled at Greenleaf's Point. The result of this examination, proving the durability and superior efficacy of this description of arms in a satisfactory manner, arrangements were soon after made for fabricating a large number of them. The arms referred to were completed in the early

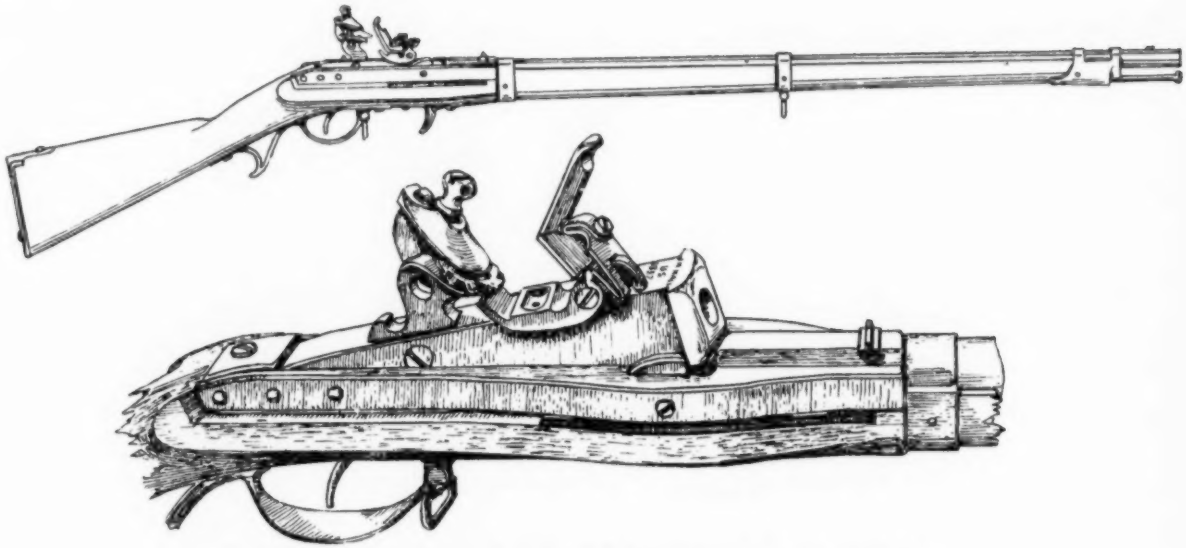


FIGURE 8.—Hall Breech-loading U. S. Rifle, Harper's Ferry 1837. This flintlock rifle was the first successful breech-loader to be developed by our army.

part of the year 1825, and in September of that year, orders were given for a portion of them to be sent to Fortress Monroe, in order that they might, in the hands of the troops at that station, be more effectually tried. Two of the companies at Fortress Monroe were armed with these rifles and have continued to use them ever since. A great number of trials have been made with them, a full account of which is contained in the report of the staff of the School of Practice. This report made by experienced officers, after a constant practice with the arms for five months, exhibits a very full view of the subject, and clearly demonstrates the great superiority of these arms over all others heretofore used in the public service. The convenience, safety and celerity with which these arms are loaded and fired, and the accuracy and effect of their fire, and the durability of the arms, have been most effectually tested, and have proved to be not inferior in any of these respects to the common arms, but generally superior in all of them, and particularly so in all that relates to celerity and effect. As a general result obtained by comparing Hall's rifles with the common rifles, and with muskets, it may be stated that with an equal number of men firing for an equal length of time, the effective shots made from each description of arms, will be in the following proportions viz: Hall's rifles, 100; common rifles, 43; muskets, 37; and this being a very decided advantage in favor of Hall's over the common rifle, as 9 to 4, and over the musket, as 8 to 3; being more than two to one in both cases. In conclusion, I would observe, that it is now 13 years since this description of arms was first presented to the notice of the government, and that for nine years past measures have been in operation for perfecting the model, and for determining the effectiveness of the arms. Two thousand stands have been nearly completed, and the recent trials with them at Fortress Monroe, which were designed to test them in the severest manner, have conclusively established their superiority."

The following remarks are from the Report of Colonel of Ordnance-Document No. 1.

"It is but an act of justice to Mr. Hall, the inventor, to state that during the whole of this period he has devoted himself, with the greatest zeal and assiduity to the perfecting of this arm and of the means for fabricating it, that in both, he has been eminently successful; and to him is due the credit of effecting so great an improvement in firearms.

"The machinery used in the fabrication of these rifles has been constructed upon a new improved plan, by which a very important improvement in the fabrication of firearms has been affected. By use of this machinery, each of the various separate parts, which, when united, form one arm, are constructed in that perfectly accurate and uniform manner, that every one of the parts of one arm will fit, exactly, the corresponding parts of any other arm of similar model.

"This degree of perfection in the fabrication of small arms, has ever been considered an object of the highest importance in all national armories, and has been frequently attempted in the armories of Europe, but hitherto without success, and the attempt has been generally abandoned from the belief that the object was unattainable.

"The machinery constructed for and used in fabricating Hall's rifles executes the work with such exactness that the component parts of one hundred rifles made some years past, have been joined to other parts made recently, without the least difficulty, all the parts fitting as exactly as if each had been separately adjusted to the particular rifle thus formed from the scattered members.

"This subject was considered of so great importance, that a board, consisting of practical armorers and intelligent gentlemen, was appointed to inspect the machinery, and the work performed by it.

George Bomford
Brevet Colonel, on ordnance service."

A contemporary of Captain John Hall was Samuel Colt, a young American who was destined to become an outstanding inventor and arms manufacturer. The idea of a percussion-cap revolving firearm did not originate with Colt;

as a matter of fact, the revolving principle had been used in flintlock weapons. Colt did perfect the system, however, and he is credited with being the inventor of the first practical revolving firearm. From the traditional military viewpoint, a weapon such as Colt's was as radical as Hall's breechloader; nevertheless, the troops in the field (against the Indians) with their single-shot, muzzle-loading muskets and pistols welcomed the idea of the Yankee inventor. As early as 1836 Colt was established in Paterson, New Jersey, engaged in the production of his arms. The Seminole and other Indian wars, then in progress, and later the Texas War for Independence became the proving grounds for Colt's revolving rifles and pistols.

The War Department purchased a few of Colt's rifles for use in Florida, and Brigadier General Jesup from that place reported favorably upon the weapons. Compared with the single-shot flintlock musket and with the rifle, then the regulation arms, their chief value was in the increase of fire power they brought to the infantry. By simply pulling back the hammer of the caliber .44 Colt rifle or musket, the cylinder revolved, and a loaded chamber lined up with the breech. Five or six shots (depending upon the model) were thus available, and, to facilitate the action of the Colt rifle, carbine, or pistol, extra cylinders, loaded and capped, could be carried. Although Colt's revolving shoulder weapons were never adopted as regulation for infantry troops, his revolving pistol became the favorite side arm of all combat unit personnel. The real triumphs of Colt firearms came in the Mexican War and later in the Civil War. In the latter struggle both armies widely used the Colt pistol. (The Confederate Ordnance Department copied the Colt design and produced a few revolvers.) Neither the revolving musket nor the revolving rifle found favor with military men, because the average soldier disliked firing with a huge cylinder so close to his face. Many of the men were afraid of multiple discharges (due to heat); and although the Colt rifle was provided with a hand hold behind the front of the cylinder, some men feared that their hands might be blown

off. The tremendous amount of gas escaping at the joint between the face of the cylinder and the breech was also a serious defect. In the pistol, which could be held at arms length from the face of the soldier, such faults could be ignored.

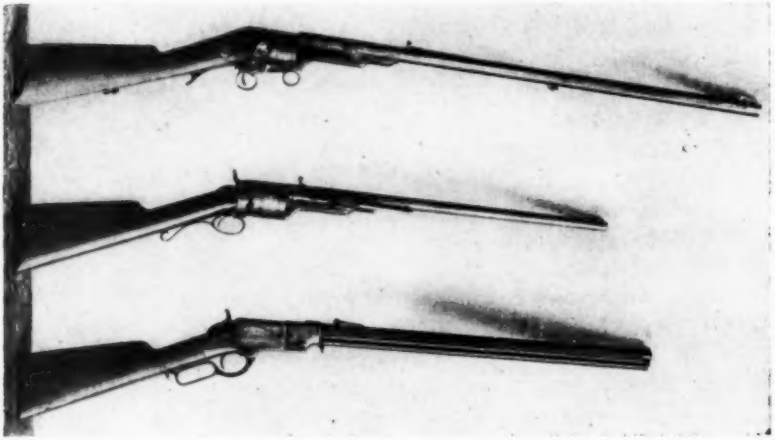


FIGURE 9.

Top to bottom—
Colt's Patent Revolving Rifle made at Paterson, N. J. in 1836.
Colt's Patent Revolving Carbine, 1837.
The Henry Repeating Rifle, period 1860. The forerunner of the famous Winchester Action.

The Mexican War marked a distinct advance in the adoption of improved weapons for infantry. Prior to this period, the regulation rifle had been the Model of 1817, a single-shot, muzzle-loading flintlock with characteristics similar to those of the Harper's Ferry Model of 1803, except that it was styled more on the lines of a musket and that provision was made for the attachment of a bayonet. This piece was noted particularly for its fine rifling and peculiar pistol-grip type of trigger guard. These rifles were made at the national armories and by contract until 1844, when all flintlock manufacture for the army was stopped, and the manufacture of percussion arms commenced.

The first percussion cap musket, smooth-bore and caliber .69, was the Model of 1842, and sufficient quantities of this weapon were turned out from 1846 to 1848 to arm a few of the regulars at the front in Mexico. It may be of interest to note that paper cartridges continued in use until after the Civil War. In the Mexican War the infantry fought almost entirely with flintlock arms. The dragoons, however, had the Colt caliber .44 revolving pistol with detachable shoulder stock.

The Model 1841 rifle popularly known as the "Mississippi Rifle" (due to its being issued to Colonel Jefferson Davis' Mississippi Regiment) was the first U. S. percussion rifle made as such. The Mississippi Rifle was one of the last brass-trimmed weapons to be issued. It was noted for its accuracy and was considered a fine rifle by the troops.

The introduction of the percussion cap in place of the flint caused much experiment, which eventually gave the army weapons with greatly increased fire power and accuracy. An improved method of igniting the powder charge, contributed by Dr. Maynard in 1845, was tested by a Board of Officers at West Point and favorably recommended for adoption by the service. The Maynard system, briefly, was this: A tape roll of percussion caps was inserted into a covered depression, or magazine, in the lock plate of the rifle or musket, and a small hand, actuated by the pulling back of the hammer, moved the roll and thus automatically placed a cap upon the cone, or nipple, at the breech of the weapon. This system saved the considerable time that it had formerly taken the soldier to reach into his cap pouch, remove the cap, and affix it to the cone. In the excitement of battle, this was a delicate procedure, due to the small size of the cap. However, it must be remembered that all regulation infantry weapons were muzzle-loaders and that the paper cartridge had to be rammed down the long caliber .58 barrel manually with the steel ram-rod. The Maynard tape primer, as it was designated, functioned efficiently as long as the tapes did not become damp. Moreover, arms equipped with the Maynard primer could also

be fired by the ordinary percussion cap; hence, the system did not alter, to any extent, the functioning of the weapon. Its greatest advantage was that it saved several motions in the "loading and firing exercise" and under favorable conditions accelerated the rate of fire.

The Maynard tape primer system was the main feature of the Model 1855 musket, the Model 1855 rifle, and the single-shot dragoon pistol. A detachable cross-hair front sight was provided for the 1855 short infantry rifle. This sight was considerably superior to any contemporary sighting equipment. In 1860, however, the Maynard system was condemned by the War Department as unreliable and was abandoned—after many years of trial.

The classic struggle for recognition of the breech-loading weapon continued. It must be remembered that the metallic cartridge, although developed to a limited degree by such inventors as Henry, Maynard, White, and others, did not come into universal use until breech-loading arms were common, and even then, many breech loaders still utilized paper or cloth and even rubber in their fixed ammunition. The infantry of both armies during the War Between The States fought almost entirely with muzzle-loading, percussion-cap muskets, caliber .58.

Upon the adoption of the percussion lock as regulation for all infantry weapons, steps were instituted for the conversion to the percussion system of the thousands of flintlock muskets then in storage. This operation consisted of removing the flash pan, the frizzen, and the flintlock hammer, and substituting therefor, the percussion hammer, and the cone or nipple, which was screwed into the piece at the breech. This alteration was an armory task, but it enabled the government to utilize weapons that, while out of date, yet retained the essential qualities of well-made arms. A limited number of smooth-bore flintlocks had rifle tubes inserted during the change-over to percussion. These converted weapons were furnished to the volunteers of the Union Army during the War Between The States. Due to the shortage of new arms and means to make them, these

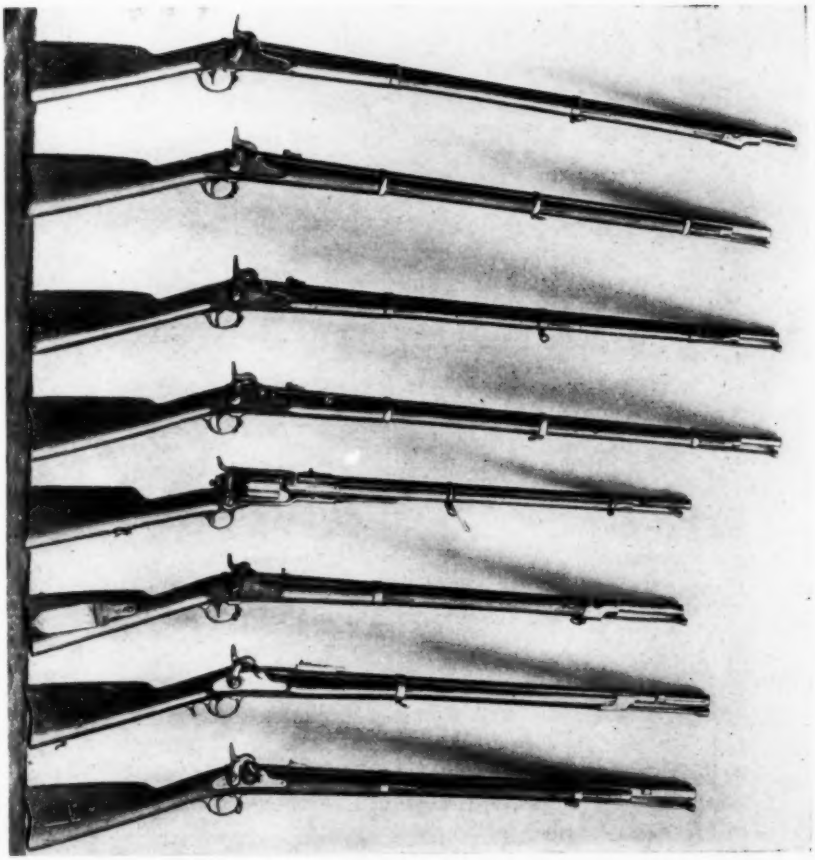


FIGURE 10.

Top to bottom—

U. S. Percussion Musket, Model 1842, the last smoothbore shoulder weapon of the Army—Springfield 1853.

U. S. Musket (rifled) Springfield 1864, a typical weapon of Union Infantry in the Civil War.

U. S. Musket (rifled) Model 1861 (Note Maynard Primer hammer still retained) Whitneyville.

C.S.A. Rifled Musket, Richmond 1863. Made of parts and from dies captured at Harper's Ferry in 1861.

Colt's revolving Rifled Musket, Model 1855.

U. S. Rifle, Model 1841 (Mississippi) Harper's Ferry, 1845.

U.S.N. Rifle, Caliber .69, Whitneyville, 1864.

U. S. Rifle, Model 1855, Maynard Tape Primer, one of the last weapons made at Harper's Ferry, dated 1861.

old weapons were the most suitable ones then on hand, and of necessity they had to be utilized. Several models of infantry shoulder arms were developed and issued during the period 1861-65. Among these were: the Model 1861 and the Model 1863-1864—all caliber .58 muzzle-loaders, made either at Springfield Armory or by private contractors. Slight differences, such as the shape of the hammer, the number of bands, and the introduction of improved sights (our first graduated-leaf rear sight appeared at this time) were the essential technical changes.

The introduction of the Minie bullet and its use by the infantry occurred prior to the opening of the Civil War; it soon became a very common type and was used by both sides throughout that struggle. The Minie was a conical bullet, caliber .58, with a hollow base fitted with a small wood or steel plug. The pressure of the powder gas forced the plug into the bullet, expanded the base to make it fit snugly into the rifling, and thus increased accuracy and range.

In order to cover the development of the breechloader during the period of the Civil War, it will be necessary to digress briefly from the weapons of the infantry to those of the cavalry. As the horseman, while in mounted action, could not handle a ramrod, a considerable problem was presented. The War Department encouraged inventors to solve this problem, and solve it they did with an array of weapons, ranging from mechanical freaks to ingenious firearms. The final result was the carbine.

The two most prominent carbines of this period were the Sharps and the Spencer. The former was a single-shot breechloader using a linen-wrapped cartridge, with the ignition supplied by a pellet-type primer cap, which was fed onto the nipple by the action of the hammer. As a cavalry arm, the Sharps was successful, in spite of its loosely fitted, lever-operated breechblock. Eventually this lever action was adopted for limited use by infantry troops but since the production of the Sharps rifle was limited during the

period when so many thousands of the carbines were required, the issue of these arms to the infantry was unusual.

The Spencer carbine was also destined to become an outstanding American weapon during the War Between The States. It was a caliber .50 repeating arm, firing seven shots and using metallic cartridges. A particularly ingenious magazine was located in the butt and operated by the action of a lever-shaped trigger guard. The cartridges were contained in metal tubes, which could be inserted into the magazine, and thus make for the rapid, easy loading and the continuous fire vital to cavalry. In addition a long infantry Spencer rifle was manufactured; but although several organizations purchased this improved weapon, it was not generally issued to the troops. In 1864 General Grant said, in speaking of the Spencer rifles, "They are the best rifles now in the hands of the troops, both as regards simplicity and rapidity in firing and superiority of manufacture."

A contemporary of the Spencer and forerunner of the famous Winchester lever-action, repeating rifle, with which most of us are well acquainted, was the Henry repeating rifle, invented by Tyler Henry in 1860. It was generally used as a carbine, but saw limited service as a rifle with the infantry during the Civil War. Like the Spencer, the Henry was an early metallic-cartridge weapon, and it contributed much to the development of the repeating shoulder firearm and the rim-fire cartridge.

After Appomattox, the huge armies were disbanded, and the small regular army turned again to the task of guarding the frontier and the great trails which led beyond. The Civil War ended the career of the muzzle-loading rifle in the United States Army. The breech-loading rifles used in that conflict, although in the experimental stage, demonstrated their superior fire power on many hard-fought fields.

After 1865 the Ordnance Department had in storage hundreds of thousands of muzzle-loading rifles which had been

turned in by the demobilized troops. These weapons, although outmoded, had all the characteristics of excellent firearms, and the War Department therefore desired to convert them into breech-loading rifles. The inventors of the country were requested to submit plans for the conversion of these weapons. Many ingenious devices were brought forth; and, after long and thorough tests, the board adopted the system submitted by E. S. Allin, master armorer at Springfield. This method of conversion, known as "Allin's Alteration," was destined to be retained, in improved form, for almost half a century.

The Allin system received the following comment in "Our Rifles," by Charles W. Sawyer, an outstanding firearms research engineer: "Many radically better systems than the Allin were offered to the Board of 1865, and no reason for the selection of the Allin can now be perceived. However, the officers of the Ordnance Department had to accept it because it was thrust upon them; and after eight years of experiments and changes it became a good mechanism; but by that time there was left of it very little of the Allin System."

Briefly, the Allin alteration may be described as follows: A new breech was added, consisting of a tubular breech-block pivoted to the barrel, and moving in a vertical plane to open. The firing pin, mortised in the right side of the block, acted as a striker, upon the descent of the hammer. The extraction mechanism which operated on a ratchet and spring was more complicated. With the exception of the breech mechanism, the rifle continued as issued during the Civil War. The caliber remained .58; but the weapon now used a rim-fire cartridge made of copper and loaded with 70 grains of black powder, giving the 450 grain lead bullet a muzzle velocity of about 1,240 feet per second.

The Model 1866 rifle was the first improved Allin conversion, and its chief feature, aside from a more satisfactory extractor, was a reduction of the caliber to .50. This was accomplished by the insertion of a rifled tube in the

old .58 caliber barrel, which still remained the regulation musket length of 40 inches.

The Models 1868-70 introduced the short 36-inch barrel, some of these being of new manufacture. However, all other parts of the rifle were supplied from the huge stock of Civil War arms still in storage.

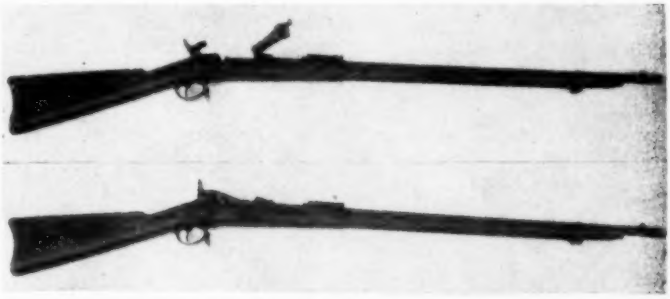


FIGURE 11.—U. S. Breech-loading Rifle, Caliber .45, Model 1884, based upon the "Allin" system. Above—breech open, below—breech closed.

The infantry in numerous later campaigns against the Indians in the west were armed with the Springfield Rifle in its various models from the 1866 to the 1889. In 1873, a new model was introduced; that is, it was made of new parts, and the caliber was reduced to .45. Due to the improvement of the Allin system, this rifle became one of the best single-loading military rifles of its day. It was a powerful arm, noted for its shock power and accuracy. The regulation load in the later models was a 500-grain lead bullet propelled by a charge of 70 grains of black powder.

During the period mentioned above, many experimental repeating and single-shot rifles (some of them were bolt action) were submitted to army boards by their inventors. Among the magazine rifles submitted for test were the Hotchkiss, in 1878, and the Chaffee-Reece, in 1882. Both of these weapons were bolt-operated, with their magazines contained in the buttstock. Their calibers were .45, and they were adapted to use the regular service ammunition.

Much experimental firing was conducted with these arms, but they were never manufactured in quantity for issue to the infantry.

The subject of a suitable bayonet received considerable attention about this time, and many and varied were the ideas and models submitted to the board. In order to appreciate the background of the bayonet in the United States Army, it will be necessary to begin with the triangular socket bayonets of the "Brown Bess" and the Charleville muskets of the Revolutionary Continentals. The form of the triangular socket bayonet survived, in slightly improved types, until 1892. The greatest improvement in this weapon was the addition in the 1840's of a locking ring, which prevented the enemy from pulling the bayonet from the muzzle during combat.

The ram-rod bayonet, an ineffective yet interesting weapon, made its appearance on the famous Hall Rifle in the 1830's, and the idea survived until 1903. The riflemen of the early U. S. Army were not provided with bayonets; eventually, however, they were furnished with all types ranging from the traditional socket bayonet to the heavy sword bayonet of the Model 1841 and the Model 1855 U. S. Rifles. Bayonets were designed for purposes other than combat. Combination bayonets and intrenching tools were developed and, in some instances, adopted for issue to the infantry. The following extract from "Our Rifles" may be of interest in this connection:

"Three new types of bayonets, offered the Board of 1872, were issued for trial. One was the Rice-Chillingworth, in which the trowel blade was designed by Lieutenant E. Rice and the combination socket and handle by Mr. F. Chillingworth. The second, proposed by Colonel Clitz, a member of the Board, was more of a spade than a bayonet, and when used as the latter would give better results as a cutting weapon, striking sideways, then as a thrusting weapon. The third was the sword bayonet already in use, modified with saw teeth cut along its upper edge. The two former of course were intended as intrenching tools, and the latter for the

use of sappers and miners. The greater part of the Model 1873 issued were, however, provided with ram-rod bayonets, some triangular and some round in cross section."

In 1905, President Roosevelt insisted that the knife bayonet with sixteen-inch blade be adopted in place of the ram-rod bayonet, with which the first Model 1903 Rifle was equipped. For service in the tropics, various forms of bolo bayonet were adopted and issued. The sixteen-inch knife bayonet survived the test of time, however, and today, it is regulation in the U. S. Army.

During the period 1890-1892, a desire for the reduction of the caliber of all infantry rifles from .45 to .30 manifested itself. The board to select a magazine rifle for the army convened in New York City from 1890 to 1892, and over fifty rifles of foreign and domestic invention were submitted for test. Even at this late date, the suggestion was made that the 45-70 Springfield, single-loading rifle be reduced to .30 caliber and retained as the regulation infantry arm. The final choice of the board was the Krag-Jorgensen rifle, a product of two Danish inventors. While the "Krag," as it was soon called, was not at first popular, due to its being of foreign invention, it eventually became a famous U. S. infantry rifle.

This rifle, our first smokeless powder weapon, was a .30 caliber, five-shot, bolt-action repeater. Its box magazine, which received the cartridges singly, held five and was peculiar for its location on the right side of the breech. No clip was necessary to load this rifle; the five cartridges were inserted in the open magazine and were fed laterally to the left and into the breech by the action of a pivoted follower, which was compressed when the magazine was opened. A cut-off provided for single loading. The "Krag" was an excellent military rifle; extraction was positive, and the smooth action functioned in a highly satisfactory manner. The bullet, covered with a cupronickel jacket, weighed 220 grains; the powder charge was 38 grains of smokeless powder; and the muzzle velocity was about 2,000 feet per second. The "Krag" was furnished to the infantry in three

models, the Models of 1892-96-98, each with improvements, of which the sighting equipment of the Model 1898 was notable.

The regular troops engaged in Cuba and the Phillippines, during the Spanish-American War and the Insurrection, were nearly all equipped with the "Krag." In the action at San Juan Hill and in the many hard-fought skirmishes of the Philippine campaigns, it proved itself to be the answer to the Spanish Mauser.

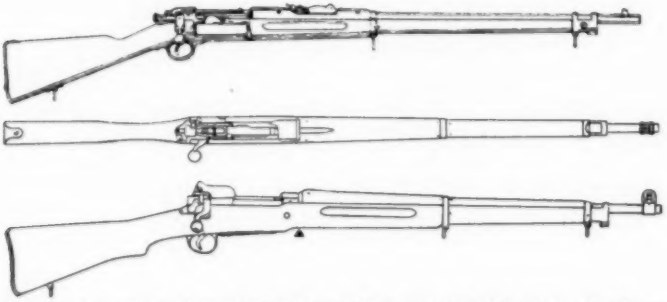


FIGURE 12.—U. S. Magazine Rifle, Caliber .30, Model 1898, the Krag and the first smokeless powder bolt-action U. S. Infantry weapon.

FIGURE 13.—U. S. Rifle, Enfield, Model 1917, the arm of our World War Infantry.

Due to the limited production of the "Krag," most of the volunteer regiments of the Spanish-American War were armed with the old 45-70 Springfield, a single loading, black powder rifle. Black powder against smokeless powder made an unequal match in the jungle combats; however, the old Springfield did have terrific hitting power with its .45 caliber bullet, but when the piece was fired, a telltale cloud of smoke might disclose the position of the rifleman.

The Krag-Jorgensen remained the regulation infantry rifle until the issue of the Model 1903 Springfield, which was primarily a modified Mauser. The adoption of this weapon with its short 24-inch barrel solved the problem of an all-service rifle, suitable for both infantry and cavalry.

The last carbine was a "Krag" made as a cavalry weapon at the same time that the infantry "Krag" was issued.

The excellence of the 1903 Springfield is well known to all; a clip-fed, five-shot, bolt-action, repeating rifle, it has earned for itself an enviable world-wide reputation for accuracy. The 1903 Springfield, as we know it today, was finally adopted in 1905; and since that time it has served, in peace and in war, with distinction and well-earned praise.

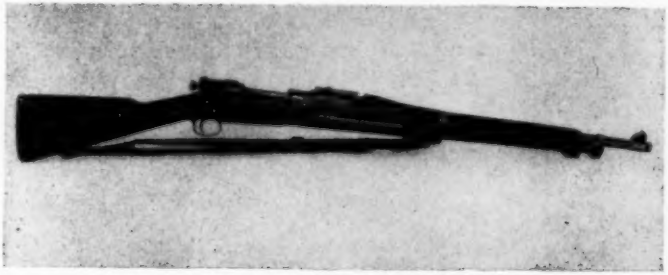


FIGURE 14.—U. S. Rifle, Springfield Model 1903, regulation for thirty years.

During the period prior to our entry into the World War, American contractors produced thousands of arms for the armies of the Allies. The British Army was furnished with the Enfield .303 rifle by various firms, such as Remington and Winchester. Due to the difficulty in increasing production at Springfield and Rock Island to arm a field force of several million men, the Enfield contractors, with their machinery already set up for mass production of that rifle, were given the task of arming our World War infantry. By changing the caliber from .303 to .30 the U. S. Model 1917 Rifle came into being. There were about 2,300,000 of these produced for the U. S. Army during 1917-1918 by Winchester at New Haven,Connecticut, and by Remington at Eddystone, Pennsylvania, and Ilion, New York.

Of the Model 1917, much can be said in its favor, although most infantrymen prefer the 1903 Springfield. The En-

field had a longer barrel, and the sighting equipment, particularly the rear sight (on the rear of the receiver) was a radical departure from the 1903 Springfield. The advantage of having the rear sight close to the shooter's eye was offset, however, by the lack of any windage adjustment.

During the war period the Springfield and Rock Island Arsenals produced over 300,000 1903 Springfield Rifles, which, added to those on hand, made almost one million 1903's available over and above the 2,300,000 Enfield Rifles produced for the U. S. Army. From these figures it can be readily seen why so many of the infantrymen found themselves armed with Enfields instead of the 1903 Springfields. Both rifles served faithfully throughout the World War and survived the test of combat conditions. With the close of the War in 1918 and the demobilization of the huge army, the 1917 Enfield rifles were placed in storage, and the 1903 Springfield again took its old place as the regulation infantry rifle for the service.

The desire for more fire power in the shoulder weapon of the infantryman began to assert itself in the late 1920's. At Springfield Armory, the design and plans for a semi-automatic rifle were drawn by one of the ordnance engineers employed there. At that time, the name Garand was not unknown among ordnance people and those who work with them. The semi-automatic rifle developed by Mr. Garand was adopted for use by the U. S. Army in 1936. Officially known as the U. S. Rifle M1, it has been slightly modified and is now being produced by Springfield Armory and by private contract. It is replacing the Model 1903 Springfield as the regulation U. S. Infantry rifle, and soon all riflemen of the United States Army will be armed with this weapon. The fire power of the M1 is two or three times greater than that of the Springfield, and the shock of recoil is thirty per cent less.

Through the years, from the days of the Charleville Musket to this present mechanized age, shoulder weapons in the hands of determined Americans have preserved the freedom

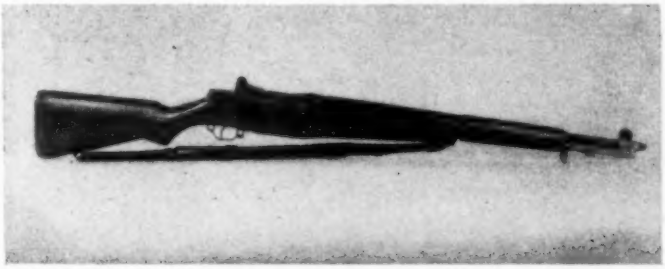


FIGURE 15.—U. S. Rifle, M1, "The Garand." The latest regulation infantry shoulder weapon for the American rifleman.

of our land. Now that it has again become necessary to fight for this freedom, no doubt the M1 will earn for itself a place of honor among its distinguished predecessors.

CHAPTER 2

A Raid to Capture an Enemy Weapon of a New Type

(AN INFANTRY SCHOOL TEACHING)

A raid and an attack are similar in that they are both offensive in character. However, the attack aims to hold its gains, while the raid may be considered an attack with a limited and temporary objective. Generally, if the project is a quick attack, without the mission of maintaining possession of a captured position, it may be called a raid.

In the usual case, the primary purpose of a raid is to gain information. Higher authority frequently orders raids in order to obtain some desired information. This is accomplished by the capture of prisoners, documents, and new war materiel; by reconnaissance of hostile dispositions; and by observation of the enemy's dispositions and strength, as disclosed by his attempts to defeat the raid. This mission is frequently supplemented by incidental or secondary purposes. For example, raiding forces may inflict damage on hostile defenses and property and cause losses to enemy personnel; and they may furnish means of inspiring confidence and aggressiveness in friendly troops and of lowering the morale of the enemy's troops.

Raids are not initiated by front-line subordinate commanders, but are executed on direction of higher authority. When a subordinate commander is directed to make a raid he performs the necessary reconnaissance and issues the order for the raid. Usually the plans of the subordinate commander are submitted for approval to the higher authority who ordered the raid.

As in night attacks, orders for raids must be simple, clear, and complete. "Completeness" does not imply "elaborateness." Sometimes orders for small raids consist of only a few short sentences. What is required is an exact statement of what each element of the raiding force is to do and when and where it is to do it.

No matter how carefully a raid is planned or how cleverly it is conceived, unforeseen and unthought of emergencies calling for immediate action are bound to arise. In no other type of action are the real qualities of leadership at a greater premium. Energy, courage, foresight, perception, and the ability to think quickly and clearly and render decisions rapidly in the face of imminent danger, are necessary to success.

A simple plan, thoroughly understood by all the raiding troops, is essential if the teamwork vital to success is to be secured. Complicated maneuvers generally result in confusion and failure. The various forms of maneuver suitable for day or night attacks are equally applicable to raids.

The suitability of the point raided has a direct bearing on the probability of the success of the raid. The point selected should be one that is difficult for the enemy to defend. Salients, dead spaces, limited fields of fire, and covered routes of approach increase a raiding force's chance of success. Proximity to our lines of the point raided and the absence of serious obstacles, or ground difficult to traverse, make for celerity in the operation and facilitate the withdrawal. There should be dugouts or shelters in the area raided, or other indications that there will be enemy personnel to capture. Numerous communication trenches, however, favor use of supporting troops by the enemy. For a supported raid, the location of the raided point should permit it to be isolated from adjacent defensive positions without danger to the raiding troops from their own supporting fires.

The objective having been determined, the next step is the selection of the troops to make the raid. Only intelligent, resolute, agile, and well-trained men should be chosen.

Such personnel lessen the chances of casualties and mistakes. Volunteers are used when possible, since the qualities of eagerness and willingness are highly important. All personnel for a raid should be selected from the same unit, unless the purpose of the raid is to bolster morale. In the latter case, the party is composed primarily of those troops who are expected to benefit most by the experience. When available, intelligence personnel should be attached to the various units of the raiding party. Since the primary mission of the raid is to secure information, the presence of intelligence personnel will facilitate the prompt transmission to higher authority of enemy information secured.

Rehearsals for the planned operation are desirable in order to give each man a clear understanding of his mission. It is also desirable that this training be conducted on terrain similar to that to be raided. The selected hostile position is indicated as clearly as possible. Such training may cover a period of from a day to several weeks. A short period makes for secrecy of the plans while a longer period provides for more complete training and understanding of individual missions.

Ordinarily, orders for raids prescribe the equipment to be carried by the raiding party. Pistols, bayonets, and hand grenades are especially desirable. Light machine guns and automatic rifles are useful weapons in the hands of protecting groups. Helmets are ordinarily left behind because they click when coming in contact with barbed wire, prevent crawling with the face to the ground, and show an unmistakable outline. Luminous compasses and watches with radium dials are valuable aids at night, but they should be carefully covered. To facilitate control, it has been found useful for officers to carry rattles or similar signal equipment. Only insignia of rank are worn. Collar ornaments, equipment bearing organization marks, and the like, are eliminated because they would identify the unit in the event of capture. Friend is distinguished from foe at night by means of some identifying marks such as white brassards. The clothing is frequently made to blend with the terrain; for

example, white cloth over the uniform may be worn to match snow, and at other times clothing and faces may be smeared with mud, pot black, or charcoal, in order to avoid contrast with dark soil. In any case, the equipment designated must fit the requirements of the specific raid.

A raiding party must have means of cutting its way through the enemy's wire. The utilization of artillery and mortar fire for this purpose has several disadvantages. It is not a positive means, and it is liable to result in the premature disclosure of the raid. Bangalore torpedoes (long sections of pipe filled with explosive) furnish a more effective method. They are pushed under the wire and discharged, and in a supported raid the noise of their explosion will frequently pass unnoticed. This method has the further advantage of preserving secrecy until the raid is well under way. However, experience has shown that unless wire is extremely strong and powerfully protected, it can be cut much more quickly and effectively by a few infantrymen with wire cutters. These men move in front of the raiding party and quickly and quietly cut their way through any wire encountered. Wire-cutting patrols may be employed to precede the raid. Guides from such patrols are then utilized to lead the raiding parties to the prepared gaps in the hostile wire.

The time that raiders start back to their own lines is either prearranged or announced by signal. The recall signal is usually given by bugle, signal horn, or rocket. For small raids the sound signal is more practical and effective, as a visual signal may not be seen or may be mistaken. In any event, a signal of some sort must be prescribed and carefully explained to the troops. If the enemy's position permits, the raiding force should advance and return by different routes.

Raids may be classified generally as follows:

Unsupported raids (often called "silent raids"), usually conducted at night, in which the raiding troops operate without fire support from such weapons as machine guns, mortars, and artillery.

Supported raids, conducted either during daylight hours or at night, in which the raiding troops are supported by some or all of the supporting weapons. These raids may be launched with or without preliminary fire preparation.

Unsupported raids.—Experience indicates that, when the object of a raid is simply to capture prisoners, the small patrol is the most effective means to that end. Ordinarily, one or a few prisoners suffice as well as a greater number. A small patrolling operation, well planned and skillfully executed, usually accomplishes the desired result. Such an operation should be simple, direct, and rapid, and is economical in effort and in men. Under some conditions, the capture of prisoners by daylight patrols is possible. Ordinarily, however, the necessary concealment can be obtained only at night. The size of a patrol varies. Too large a patrol is difficult to conceal, while one too small may be too weak to act effectively when the proper moment arrives.

Supported raids.—Although an unsupported raid executed by a patrol is preferable when it can accomplish the desired results, supported raids have been found necessary in the past, and it hardly seems warranted to assume that there will be no occasion requiring their use in the future. If the situation requires that the raid be carried out by a force of infantry stronger than a small patrol, such a force can hardly expect to find protection in concealment. If it be discovered early enough, it is almost certain to sustain heavy losses and to fail in its mission. Therefore, large raids require supporting weapons. These supporting weapons are used, in general, to neutralize, as completely as possible, all defensive power which the enemy can bring to bear on the raided point, either in the form of men or fire power. Under this protection, the raiding troops carry out their mission and quickly withdraw. When the protection is complete, as it should preferably be, the raiding troops operate with relatively little fighting and with slight losses.

There may be an artillery preparation. The controlling considerations are, in general, the same as those in any at-

tack. Usually, however, it is best to dispense with artillery preparations, for even a brief warning of an impending raid permits the enemy to make hasty dispositions that may defeat the raid. Surprise and swift execution are essential to a successful raid. During the actual raid, artillery may be employed to neutralize known or suspected hostile positions. It may place successive concentrations in front of the raiding infantry, or it may isolate the area raided by concentrations wholly, or partially, encircling this locality on the enemy's side. The latter form of fire, called a "box barrage," is placed to prevent the occupants from fleeing and to prevent reinforcements from entering the area. The artillery may also, in appropriate cases, place fires at other points to deceive the enemy.

The raiding troops are generally subdivided into parties, each having a specific mission. An officer should command each such party. The subdivisions generally are for two purposes; some parties are organized for attacking and cleaning up specified points; and others, for protecting these raiding parties while they are accomplishing their missions.

Protecting groups should include—

1. Groups to clear route of advance and protect movement of raiding force to the assault positions.

2. Groups to cut gaps in enemy wire, and to protect passage of raiding force through the wire.

3. Groups to protect flanks and rear of raiding force during the assault.

4. Groups to cut gaps on route of withdrawal and protect the withdrawal.

Sometimes supports are advisable as are, also, detachments for handling prisoners. The exact dispositions vary with different situations. Such detachments should be kept to a minimum, but on the other hand, they should provide for all anticipated contingencies.

Supported raids are most often carried out at dawn, twilight, or under similar conditions of visibility, in order to avoid extensive hostile observation and yet have enough light for close combat purposes. There is no hard and fast

rule, however, relative to the degree of visibility necessary. There are examples of supported raids that have been executed successfully both in full darkness and in broad daylight.

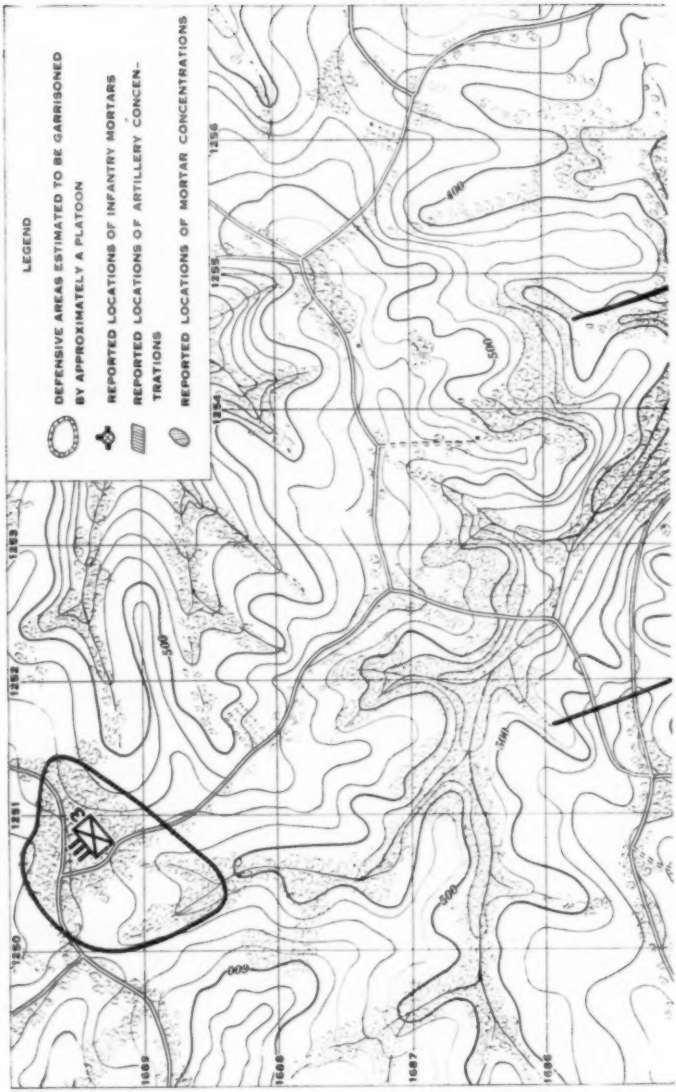
The various steps that are followed in the preparation for a raid may be as follows: Assume that a sector has been quiet for several days and that the commander has decided to execute a raid for the purpose of capturing prisoners and to increase the fighting spirit of his organization. Although the commander may believe that a raid should be undertaken at once, he will most likely wait at least until the following night, for there is information to be obtained without which the raid cannot be intelligently planned and staged. For instance, a more or less isolated enemy post or outguard must be located; gaps in the hostile wire, or points at which they are to be created, must be determined; detailed information must be obtained of the ground over which the raiding force must pass; plans must be prepared and rehearsed, and equipment must be made ready. Since most of this information can be secured only under cover of darkness, at least one night should usually elapse before the raid is actually undertaken.

The raid leader organizes his party and rehearses his plans. He assures himself that every man is thoroughly familiar with his particular job. He makes a detailed inspection of his party and their equipment to assure himself that all men are present, are well, and carry the prescribed equipment.

The accompanying map exercise illustrates a supported raid to capture an enemy infantry mortar of a new type.

SITUATION

The Blue 1st Division, an interior division, after driving a Red delaying force to the southeast, was stopped on 25 December by a Red force occupying the defensive position as shown. (Figure 16—Situation Map) Orders from higher headquarters, received during the night 25-26 December,


LEGEND
DEFENSIVE AREAS ESTIMATED TO BE GARRISONED BY APPROXIMATELY A PLATOON
REPORTED LOCATIONS OF INFANTRY MORTARS
REPORTED LOCATIONS OF ARTILLERY CONCENTRATIONS
REPORTED LOCATIONS OF MORTAR CONCENTRATIONS
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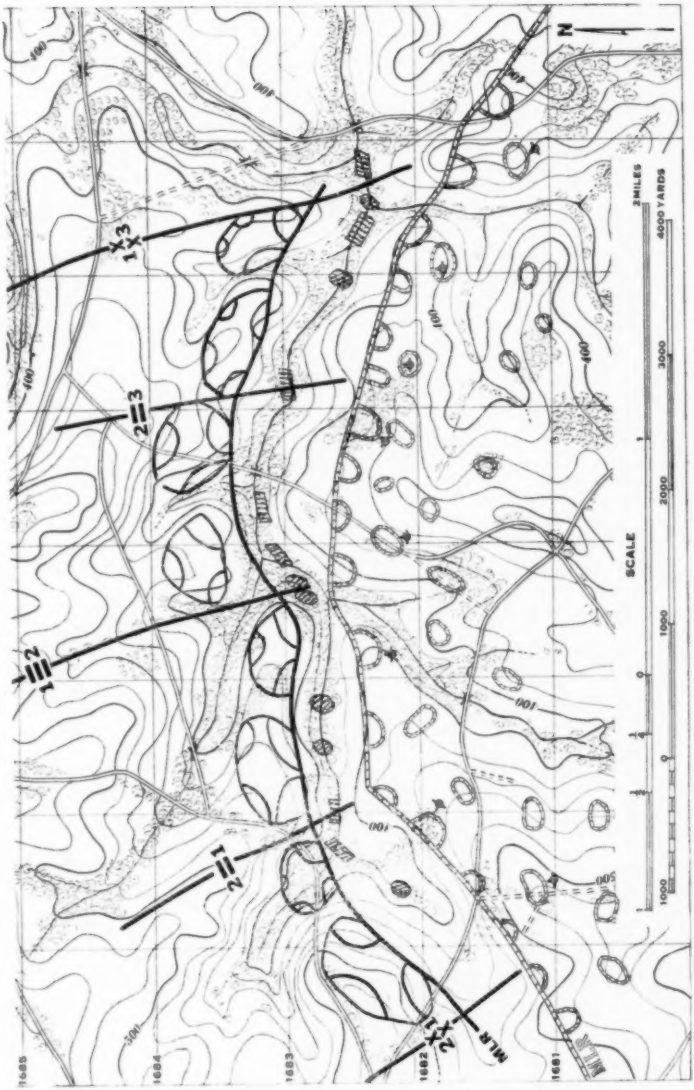


FIGURE 16.—Situation Map.

directed the 1st Division to hold its present position pending a general resumption of the offensive and to maintain continuous pressure on the enemy to ascertain his future intentions. In compliance with these orders, the 1st Division consolidated its position as shown in part, and directed the 1st and 2d Infantry to execute vigorous night patrolling.

On 27 December, the 3d Infantry is in division reserve in an assembly area as shown. At 7:00 AM the regimental commander 3d Infantry, in conference with Major S-3, issues the following instructions:

"Division G-2 reports that the enemy rifle companies, on the front of this division, have been equipped with a new type infantry light mortar of superior characteristics. The division commander directs that elements of the 3d Infantry make a supported raid on a defensive area of the enemy position within the next ninety-six hours for the purpose of capturing one of the new infantry mortars. The raid will be supported by two battalions of light artillery and such additional supporting arms and services as may be requested. This map from Division G-3 (Figure 16, Situation Map) shows the locations and estimated strength of the enemy defensive areas, the general areas where registration of enemy defensive fires have been reported, and the position areas of certain enemy mortars. This information is based upon reports received in the office of the Division G-2 and has been verified by captured prisoners and documents and by airplane photographs. You will accompany me in one hour for a conference with the Division G-3. In the meantime study the situation and be prepared to make recommendations for the raid."

FIRST REQUIREMENT

As Major S-3, 3d Infantry, prepare your recommendations, with reasons therefor, relative to the following:

1. Selection of the area to be raided.
2. Approximate size of the raiding party to be employed.
3. Date of raid and whether it should be made in daylight or during darkness.

4. Request, if any, to be made for the following supporting arms or services:

	Yes or No	Mission
a. Chemical Warfare Service.		
b. Air Corps.		
c. Supporting infantry weapons.		
d. Engineers.		

A SOLUTION OF FIRST REQUIREMENT

S-3's recommendations and reasons are as follows:

1. *Selection of the area to be raided.*—To raid the hostile defensive area at (52.3-82.4) and the reported site of the infantry mortar at (52.3-82.2).

In order to capture the mortar at (52.3-82.2) it is necessary to overcome only one platoon defensive area. In capturing any other located mortar, two or more platoon defensive areas would have to be overcome, which would necessitate the employment of a larger raiding force.

As this area covers an important avenue of approach into the hostile position, the mortar will undoubtedly be retained in position both day and night.

The selection of a larger area to be raided would necessitate the employment of a greater number of supporting weapons than have been made available to protect the raiding force.

The area is so located that it can be isolated by placing artillery and infantry fires on adjacent positions without jeopardizing the raiding force.

The route of withdrawal from this area is over the shortest distance between the front lines of the opposing forces on the division front.

2. *Approximate size of the raiding party.*—One rifle company.

The location of the enemy defensive area is such that it is probably garrisoned by a platoon with automatic weapons. To overcome this position completely in a short period of time and to furnish adequate flank protection will necessitate the employment of at least a rifle company. On the

other hand, it should not be necessary to employ as much as two rifle companies to accomplish the mission. As the size of the raiding force increases, secrecy, speed of movement, and control decreases. The size of the raiding force should therefore be held to a minimum to accomplish the mission.

3. *Date of raid and when conducted.*—The raid to be conducted the night of 30-31 December and to be initiated and completed during the hours of darkness.

The maximum amount of available time should be allowed for reconnoitering, planning, and rehearsing for the raid. At least one night, and preferably two nights, should intervene between the receipt of orders for the raid and its execution. During the first night, the commander of the raiding party should institute the preliminary reconnaissance for routes to and from the enemy position, for the location of flank groups to protect the raid, for the location of enemy wire and obstacles, and for the location of new enemy positions. On the second and succeeding nights, reconnaissance should be made by the necessary key personnel of the raiding party to locate definitely and mark routes and positions. Succeeding nights may profitably be employed in rehearsing the raid over terrain similar to that which has been selected for raiding.

A raid initiated or concluded in daylight would result in excessive casualties because of the excellent enemy observation afforded by the terrain. It must be assumed that the enemy has prepared concentrations covering the entire front of his position and that these fires will be placed promptly on the raiding force if its movements are observed, either during the movement to its attack position or during its withdrawal. The blinding of the hostile observation by smoke is impracticable because of the large area which would have to be smoked in order effectively and simultaneously to blind all enemy observation.

4. *Request for supporting arms and services with their general missions.*

Arm or Service	Yes or No	Mission
a. Chemical Warfare Service	No	None.
b. Air Corps	Yes	Photographic observation.
c. Supporting infantry weapons	Yes	Fires in support of the raid.
d. Engineers	No	Not requested until preliminary reconnaissance is completed.

If the raid is to be conducted during the night, the use of smoke to blind hostile observation is unnecessary and Chemical Warfare Service troops will not be needed.

The area to be raided, and adjacent defensive positions, should be photographed each day to determine promptly any changes in the hostile defenses which might necessitate alterations in the plan for the raid. To insure that this is done, the 3d Infantry should specifically request it.

Two battalions of artillery are insufficient to neutralize all adjacent hostile defensive positions which can bring fire upon the raided area and, simultaneously, to block all avenues of approach by which hostile reinforcements might reach the raided area. The employment of infantry supporting weapons, 81-mm mortars in particular, to fill in the gaps in the artillery barrage, will be essential if the raiding force is to be adequately protected. All supporting weapons must be registered on their targets prior to the raid. The enemy's suspicions may be aroused if he notices any marked increase in the number of infantry supporting weapons firing from that part of our lines adjacent to the point to be raided. The chances of this premature disclosure of our intentions will be reduced if the heavy weapons companies of the 1st Battalion 1st Infantry and the 2d Bat-

talion 2d Infantry are used to fire in support of the raid from positions within their own battalion defense areas. A specific request for their assignment to this mission should, therefore, be made.

The first night reconnaissance preparatory to the raid should disclose whether there exist any obstacles to movement sufficiently serious to require the presence of engineer troops. They would not be requested until a need for them was established.

SITUATION, CONTINUED

The commanding officer 3d Infantry returned to his command post, and at 11:00 AM issued the following oral order to Lieutenant Colonel 1st Battalion 3d Infantry:

"Prepare plans for a raid to be conducted by a rifle company of your battalion on the hostile position to include the defensive area at (52.3-82.4) and the site of the enemy mortar at (52.3-82.2), the night of 30-31 December, for the purpose of capturing that weapon. This map (Figure 16—Situation Map) which is made available to you shows the reported hostile dispositions and defensive fires. Two battalions of light artillery and two heavy weapons companies, one each from the 1st Infantry and 2d Infantry, have been made available to support the raid. Submit a detailed plan for the raid by 11:00 AM tomorrow."

SECOND REQUIREMENT

Actions taken and orders issued by the commanding officer 1st Battalion 3d Infantry from the time he receives the order until the preparation of the final plan to be submitted to the commanding officer 3d Infantry.

A SOLUTION OF SECOND REQUIREMENT

The actions and orders of the commanding officer 1st Battalion 3d Infantry are as follows:

Confers with S-3 3d Infantry and requests that S-3 arrange that vertical and oblique air photographs be taken this afternoon of the area to be raided. Also requests that

S-3 arrange that the commanding officers of the heavy weapons companies and the artillery units to support the raid meet him at the command post of the 1st Battalion 1st Infantry at 3:00 PM.

Requests S-2 3d Infantry to obtain information on enemy activities with particular reference to the position to be raided and the location of the mortar to be captured.

Returns to his battalion command post and formulates from a map study a tentative plan of supporting fires.

Issues the following warning order to Captain Company A: "On the night of 30-31 December your company will raid the hostile position embracing the platoon defensive area at (52.3-82.4) and the site of the infantry mortar at (52.3-82.2) for the purpose of capturing that weapon. Shown on this map are the location of the mortar, the enemy dispositions, and the fires which the enemy has placed in defense of his position. I will furnish you a tentative plan of supporting fires later today. You will reconnoiter tonight for routes to a position from which the raid may be launched, for routes of withdrawal, for the location of enemy wire and other obstacles, and to determine if such obstacles can be passed without the aid of engineer troops. Submit your detailed plan for the conduct of the raid not later than 8:00 AM tomorrow."

Accompanied by Captain Company D, visits the command post of the 1st Infantry for a conference with the S-2 and S-3 of that regiment.

Moves to the area of the 1st Battalion 1st Infantry and observes the enemy position and terrain in the vicinity of the area to be raided.

Goes to the command post 1st Battalion 1st Infantry at 3:00 PM and holds a conference with the commanding officers of the heavy weapons companies and the commanding officers of the field artillery battalions that are to support the raid, discussing the fires he will request of those units in support of the raid.

Returns to his command post, completes his tentative plan of supporting fires, and causes an overlay showing this

plan to be prepared and sent to commanding officer Company A. Receives from Captain Company A the detailed plan for the execution of the raid and his recommendations for any adjustment in the tentative plan of fire support.

A DISCUSSION OF SECOND REQUIREMENT

The detailed plan for the conduct of the raid which is to be submitted to the regimental commander must include a detailed plan for the actual execution of the raid by the raiding force and a detailed plan of supporting fires to protect the raiding force.

The detailed plan for the execution of the raid by the raiding force may be prepared by the battalion commander or by the commander of the actual raiding force. Where there are no vital reasons to the contrary, it is preferable that this plan be prepared by the commander of the raiding force since, after all, he and his unit must actually execute the raid. The battalion commander should, therefore, promptly select the unit to make the raid, issue a warning order to its commander, direct the initiation of the necessary preliminary reconnaissance, and call for the submission of a plan at such a time as will enable it to be incorporated into the plan to be submitted to the regimental commander.

The detailed plan of supporting fires should be prepared by the battalion commander. His rank and position facilitate contact with the commanders of the artillery and heavy weapons units detailed to support the raid. In addition he has the time available to make these contacts while Captain Company A will be busy in planning the reconnaissances to be made tonight and in making the necessary preparations therefor. His tentative plan of supporting fires should be furnished Captain Company A in time for the latter to study it prior to the reconnaissance tonight. Captain Company A will then be in a position to suggest changes in the plan which may be necessary properly to coordinate it with his own plan for the actual execution of the raid.

SITUATION, CONTINUED

As a result of his reconnaissance on the night of 27-28 December, Captain Company A secured the information of the hostile wire and the terrain in the immediate vicinity of the position to be raided, as shown (Figure 17, Operation

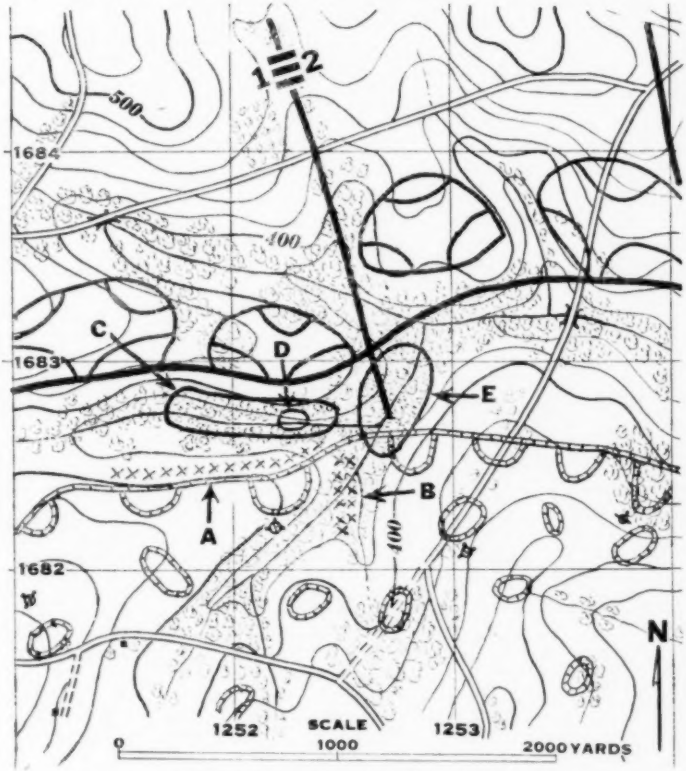


FIGURE 17.—Operation Map No. 1.

LEGEND

A Single belt double apron-can be cut and passed by infantry troops
B Double apron covered by loose wire-can not be passed unless cut by artillery fire or explosives
C Stream three feet wide and one foot deep-numerous foot trails through underbrush-ground firm
D Clearing in underbrush along creek bank
E Woods thick with underbrush-marchy ground-difficult to advance through

Map No. 1). The following additional data was obtained by Captain Company A:

Date	Dark	Daylight	Moon Rises	Moon Sets
Dec 27-31	5:45 PM	6:30 AM	10:30 PM	3:00 AM

THIRD REQUIREMENT

Give so much of the plan of Captain Company A for the raid as includes the following items only:

1. Hour of the raid and reasons therefor.
2. Organization of the raiding force to include missions assigned subordinate elements (assuming any request for additional troops is granted).
3. Request for additional troops, if any, to supplement the raiding force.
4. Route and formation from the assembly area to the location from which the raid is to be launched.
5. Area of assembly after the raid is completed.
6. *a*. Communication.
   b. Identification within the raiding force.
   c. Signals to be employed.

Give the plan of supporting fires submitted by Lieutenant Colonel 3d Battalion to the Commanding Officer 3d Infantry.

A SOLUTION OF THIRD REQUIREMENT

1. The hour of the raid to be 11:00 PM. The moon rises at 10:30 PM and will assist the raiding force in its movement to the position from which the assault will be launched and subsequently during the conduct of the raid. The raid is to be made as early as possible after the moon rises because the enemy will probably feel more secure in their position in the early evening than in the hours preceding daylight.

2. The raiding force to be organized as follows:

Raiding party No. 1—1st Platoon.

Raiding party No. 2—2d Platoon (less 3d squad and automatic rifle squad).

Raiding party No. 3—3d Platoon with 5 (five) men from the light machine-gun section attached as carrying party for captured weapons.

Patrol No. 1—3d squad and automatic rifle squad 2d Platoon.

Patrol No. 2—Platoon to be requested (less one squad and automatic rifle squad).

Patrol No. 3—One squad and automatic rifle squad of platoon to be requested.

Weapons Platoon (less men attached to Raiding party No. 3) is not to be employed in the raiding force.

For missions assigned above elements of the raiding force see Figure 18—Operations Map No. 2.

3. To request that an additional rifle platoon be attached to the company for the purpose of furnishing flank protection for the raiding force.

4. Route from the assembly area to the position from which the assault will be launched: (See Figure 3—Operation Map No. 2). Formation: Raiding party No. 3, Raiding party No. 2, Raiding party No. 1. Patrols Nos. 1, 2 and 3 to precede the company by one hour.

5. Point of assembly after the raid: (See Figure 18—Operation Map No. 2.)

6. *a.* (1) A radio telephone, SCR-195, to be requested to facilitate communication between the raiding force commander and the battalion commander.

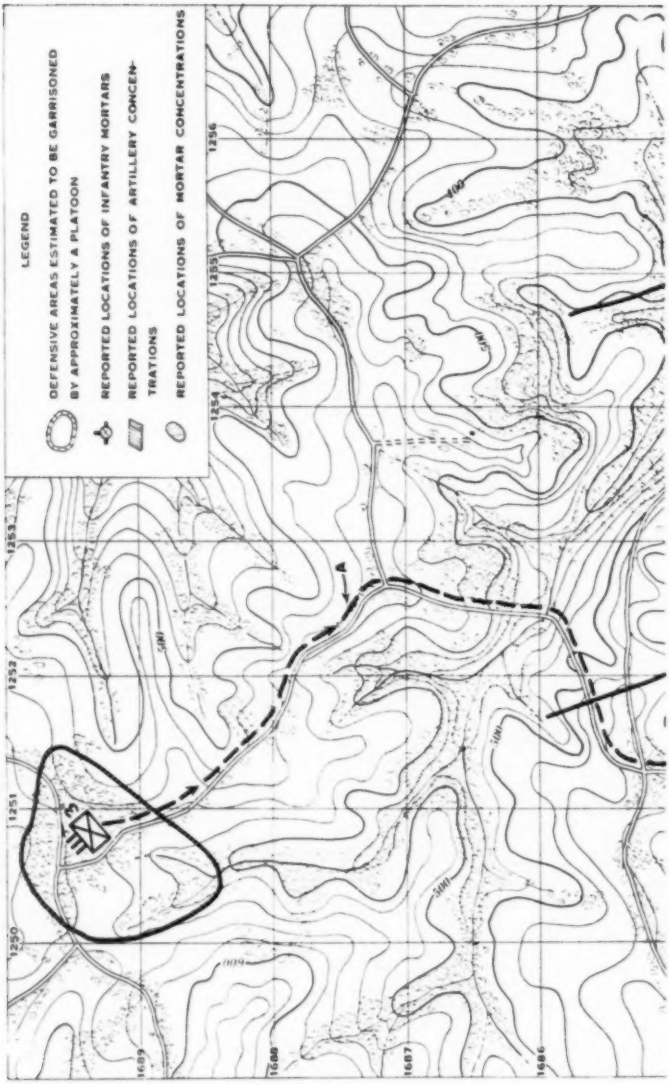
(2) Communication between elements of the raiding force by messengers.

b. Each man of the rading force to wear a large white arm band on each arm for identification. A parole and countersign to be designated for identification during darkness.

c. Signals:

(1) Red chain parachute signal for the lifting of supporting fires.

(2) Three short blasts on the whistle for the withdrawal from the raided platoon defense area.


LEGEND
DEFENSIVE AREAS ESTIMATED TO BE GARRISONED BY APPROXIMATELY A PLATOON
REPORTED LOCATIONS OF INFANTRY MORTARS
REPORTED LOCATIONS OF ARTILLERY CONCENTRATIONS
REPORTED LOCATIONS OF MORTAR CONCENTRATIONS
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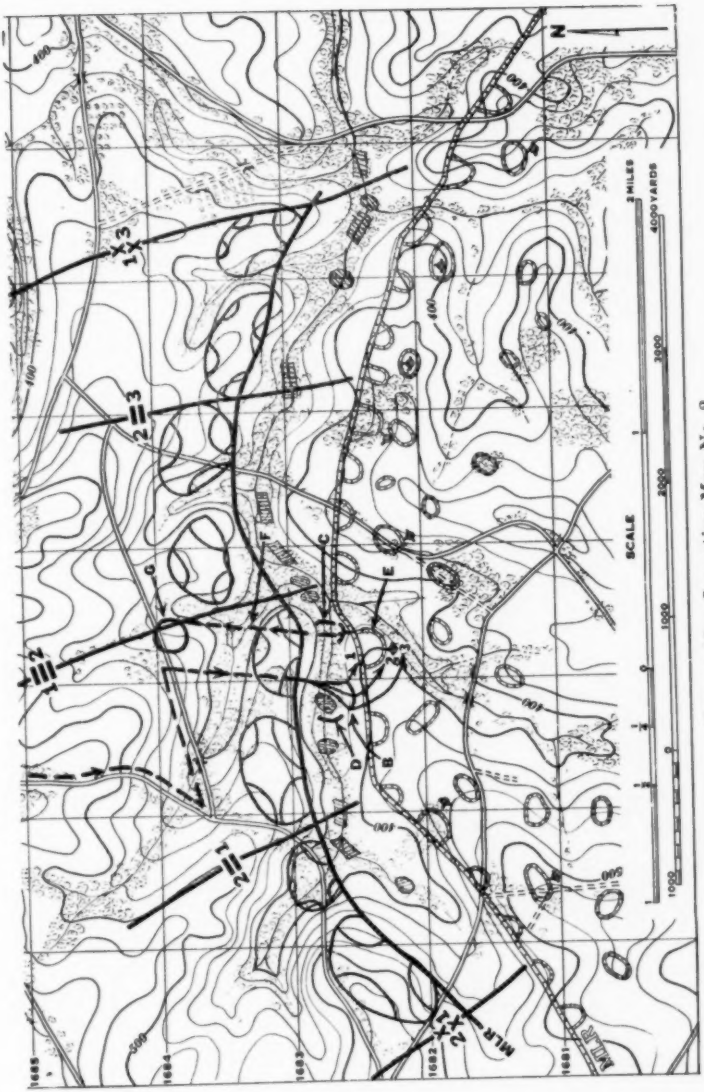

FIGURE 18.—Operation Map No. 2.

(3) Green Very pistol signal for the withdrawal from the defense area.

7. Plan of supporting fires (see Figure 19—Operation Map No. 3).

A DISCUSSION OF THIRD REQUIREMENT

Captain Company A's plan for the raid contemplates a movement through the wire about midway between the position to be raided and the next adjacent defense position to the west. This will enable gaps to be cut in the wire with least chance of discovery by the enemy and will permit a flank, rather than a frontal, attack against the hostile position. A separate route for withdrawal is selected both to make it more difficult for the enemy to interfere with the withdrawal and to avoid any raiding party having to retrace its steps.

The garrison of the position to be raided will undoubtedly be disposed in a forward echelon and a support echelon. The mortar which is to be captured is located outside the limits of the defense position. Once inside the wire, therefore, the mission of Company A logically divides itself into three parts; namely, the overwhelming of the hostile garrison in the forward part of the defensive position, the overwhelming of the garrison in the rear part of the defensive position, and the capture of the mortar. The raiding force is therefore divided into three raiding parties, each under a lieutenant. Each is assigned a definite mission covering both the raid itself and the withdrawal therefrom.

To provide adequate security for the raiding force the area between our front line and the vicinity of the point to be raided must be cleared of hostile patrols before the arrival of any part of the raiding force proper and must be kept clear until after the raiding parties have withdrawn. Gaps must also be cut through the hostile wire both on the route of advance and on the route of withdrawal. Since the gaps on the route of withdrawal can be cut while the raid is in progress, a patrol of two squads should be able to prepare these gaps as well as to protect the left flank. On the right flank, however, the various missions of protecting

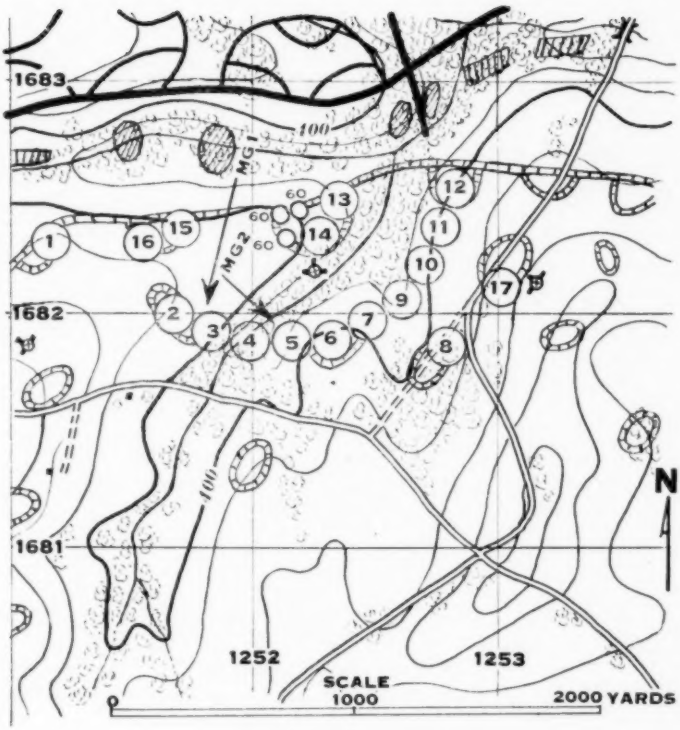

FIGURE 19.—Operation Map No. 3.

Concentrations No.	*Time*	*Unit to fire*
2, 3, 6	H-10 to sig. to lift	Artillery
1, 8, 12	H-10 to H	Artillery
4	H to sig. to lift	Artillery
8, 9	H to sig. to lift	Btry Artillery
12, 17	H to sig. to lift	Btry Artillery
13, 14	H-10 to H	81-mm plat 1st Inf
5, 7	H to sig. to lift	81-mm plat 1st Inf
11	H to sig. to lift	81-mm plat 2d Inf
17	H-10 to H-10	81-mm plat 2d Inf
10	H-10 to sig. to lift	81-mm plat 2d Inf
15, 16	H-10 to sig. to lift	81-mm plat Co. D 3d Inf
MG 1, MG2	H-10 to sig. to lift	2 cal .30 MG plats Co. D 3d Inf
(60)	H-10 to H	Mort sec Co. A 3d Inf

against patrols, cutting gaps prior to the raid, and protecting the rear of the raiding parties during the raid make it preferable to have two patrols. Since the provision of all these security detachments would seriously deplete the strength of the raiding parties, Captain Company A should request the attachment of an additional rifle platoon. The instructions for the withdrawal provide the maximum security for each element and also insure, as far as possible, that the purpose of the raid, i. e., the delivery within our lines of the captured mortar, will be successfully accomplished whether all of the raiding force is able to withdraw or not.

The plan of supporting fires provides for the neutralization of all hostile defensive positions during the period in which they might be able to bring fire upon the raiding force. It also provides for the blocking of all avenues of approach to the raided area where it is reasonable to assume that reinforcements would pass en route to the raided area. The artillery fire is so placed that at no time does the raiding force come within 300 yards of it. The fire of the 81-mm mortars is placed on targets closer to the raiding force. On certain targets, which are of lesser importance because of their distance from the point to be raided and the nature of the intervening ground, one artillery battery is assigned two concentrations, which it will fire alternately.

Both a visual and sound signal for withdrawal are prescribed to provide double assurance that no unit will fail to receive the order to withdraw.

This article shows how carefully the German Squad is trained under the supervision of the platoon commander. Actually some of our own more energetic young platoon commanders are doing practically the same thing in our army. For others who are having less success with their platoons this article may prove helpful.

CHAPTER 3

Combat Training of the Rifle Squad Within the Rifle Platoon

By

Major OTTO PETER, Infantry, German Army

Deutsche Wehr, Berlin, Germany

January 3, 1941

Translated from the German
in the
TRANSLATION SECTION
THE ARMY WAR COLLEGE
Washington, D. C.
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Tech. Sgt. Fred W. Morton
U. S. Army
May 1941

OLIVER L. SPAULDING
Colonel, U. S. Army, Retired
Chief, Translation Section

I. Squad Training, the Basis of the Work of the Platoon Commander.

The school of the soldier, which in a sense concludes with the inspection of recruits, is followed by squad training. Squad training invariably constitutes the basis for unit training as such, that is, the training of the platoon and company.* While drill is relegated far to the background, field exercises take up the greater part of the schedule of the rifle company and become the most important phase of training. If the provisions contained in Memorandum, October 13, 1939, with reference to H. Div. 130/2b (H. Dv.-Heeresdruckvorschrift—German TR) are carried out and the combat training of the individual soldier within the rifle squad is planned and executed in logical order, that is, if all of the tasks assigned to the individual rifleman are fitted plainly into the framework of the squad as a unit, the transition to squad training will present no major obstructions. If that is done, the individual soldier from the outset of his training will learn in a practical manner and feel assured that he is not "fighting alone in the broad expanse of the battlefield," but constitutes an organic part (a member) of a larger combat team, his squad. With the inception of squad training, the individual soldier takes the second step toward his introduction to the atmosphere of war; he is required now to fight in cooperation with the other men of his squad; to follow his squad leader; to apply expertly to the combat of the entire squad what he

*According to Paragrah 64, Chapter 1, Memorandum of October 13, 1939, with reference to H. Dv. 130/2b (German TR), platoon exercises follow the school of the soldier immediately. Paragraph 90 (No. 20, Annex) of the Memorandum does not provide for a special period of squad training between the school of the soldier and unit training. On the contrary, the execution of squad problems is demanded throughout the year; and emphasis is placed on the importance of squad training. The practical training discussed in the present article is not affected by those paragraphs of the Memorandum. The shorter the training period in war, the more conscientiously the brief space of time available must be exploited for the conduct of squad problems—primarily as regards march discipline and advanced training—in order to achieve the purpose of every squad exercise, namely, that of developing field soldiers. Besides, squad training within the platoon is already included in the training schedule for the 7th and 8th weeks of the German replacement units.

has learned in the school of the soldier; and to improve upon it constantly. Thus, the soldier is taught to regard the squad as a family, and himself as a member of that family. He must realize that he is not permitted to leave the family circle and fight on his own, but must subordinate himself to the head of the family, the squad leader, and learn to place the welfare of the family above his own. Close teamwork with his fellow-soldiers is the only means by which the individual soldier can fight successfully and meet the emergency situations which arise in combat. To quote a phrase coined by the German World War soldier: "Soldatenblut, Kameradenblut ist nimmer allein, immer mussen bei Soldaten Kameraden sein." In other words, without teamwork in battle the individual soldier can accomplish nothing; as a member of a team, he is everything. Here we have the psychological content of squad training.

The training of the squad within the platoon is a function which devolves upon the platoon commander. During the period of combat training of the individual soldier, the platoon commander acts more or less in the capacity of constant helper and professional adviser of his noncommissioned officers, while they are "working on the man," under his keen supervision. When squad training is taken up, however, the platoon commander becomes the actual instructor. He must not supervise the work of his squad leaders, but must take full charge of the entire training of his squads. The responsibility thus rests solely with the platoon commander. As chief instructor, it is his task to train the squad leader to become the leader and "first fighting man" (Vorkämpfer) of his squad; to develop him into an alert and active soldier; and, at the same time, to train the men of the squad. Both, the schooling of the squad leader in leadership and the training of the men, are of equal importance. Therefore, it would be an unjustifiable mistake to let the squad leader work independently, that is, to charge him simultaneously with the command of the squad and its training.[1] The result would be nil. Where

(1) This differs somewhat from our method of training.

the platoon commander is the sole instructor in his platoon, that is, where there is no suitable platoon sergeant who may serve as assistant instructor—a provision which every company commander should try to make—the only procedure open to the platoon commander is to take up each problem separately with each squad of his platoon, thus making sure that the various training phases are drilled thoroughly into the minds of the leader and men of each squad. If time is short, a squad may learn also from watching another squad in action. However, this method is satisfactory only if the platoon commander carefully instructs the squad leader in advance, with regard to the mission and plan of action, so that the squad leader may explain to his men the movements that are being developed before their eyes. Non-participating squads meanwhile may refresh their minds in such matters as terrain description, range estimation, target recognition, target description, sight-setting, instruction in the delivery of surprise fire as a preparation for combat firing, or the squad problem that will be taken up next. In order to prevent a waste of time, the platoon commander must discuss the problem and its method of execution with his squad leaders and their seconds-in-command thoroughly before marching into the field and, again, briefly upon arrival in the exercise area. He must designate one or two of his best non-commissioned officers as assistant instructors and umpires (they must be marked as umpires), since he cannot handle and supervise everything personally. Furthermore, he must assign one or, perhaps, two privates first class as leaders of the "enemy," making sure that they will carry out his instructions accurately. It is not necessary to execute several squad problems in the course of a morning or afternoon, for it is better to carry out only one problem, but to do that thoroughly.

Before discussing the various tasks which face the platoon commander in the preparation, execution, and correction of squad training, we shall review once more the vital factors which the squad leader and his men must learn in the combat school of the squad.

(1) The squad leader as a student is governed by the requirements stated in Paragraphs 3 and 36, Memorandum of October 13, 1939:

The squad leader is the leader and "first fighting man" of his squad. He actually leads his men on the ground. The platoon commander must constantly bear in mind this cardinal demand so that he may keep on the right path in training his squads. Accordingly, every problem which he conducts with a squad must be aimed at molding the squad leader into an active and determined leader, a model fighting man, and an example to his men. There are two principal lessons which the squad leader must learn from the platoon commander in squad training (with reference to the attack, which is the most vital phase of tactics): First, the squad leader must learn to lead his squad while advancing under hostile fire up to the point at which his squad opens fire; next, he must learn to lead his squad during the fire fight and penetration of the hostile lines. Squad training centers in the instruction in combat firing, as stressed in Paragraph 52, H. Dv. 130/9. The platoon commander, in his capacity of instructor, again and again must "dig up" the regulations which state clearly the requirements of the squad leader. Some of the most essential principles of leadership are contained in the following paragraphs:

(a) H. Dv. 130/2b, Paragraph 389: "The squad leaders first lead their squads as near the enemy as possible without firing. In so doing, the squads are supported by artillery and heavy infantry weapons and exploit all cover of the ground and zones on which the enemy has not concentrated his fire. The squad leader does not order his light machine gun to open fire until the terrain and effect of the hostile fire make it necessary, which usually occurs at medium ranges (see below, Paragraph 38 of the Memorandum). The greater the delay in opening fire, the more time and ammunition will be saved. After that, the advance is a continuous change between fire and movement . . ." (One squad must help the other.)

(b) Memorandum, October 13, 1939, Paragraph 37: "The fire fight is conducted within the framework of the squad . . ." This makes the squad leader responsible for the fire fight.

Paragraph 38: "If the situation makes it necessary to open fire, the squad leader usually employs at first only his light machine gun; he directs the fire . . ."

Paragraph 41: "As a rule, the squad leader determines when to open fire."

Paragraph 45: ". . . Assurance must be had that the squad leader can exercise his influence on his men (i.e. while the squad is pushing forward)."

Paragraph 47: "The situation and hostile fire permitting, the squad leader takes advantage of all support by adjacent squads or heavy weapons, in order to enable all members of his squad to jump off for the assault simultaneously." This point is important.

Paragraph 48: "The squad leader exploits every opportunity to penetrate into the hostile lines, without waiting for special orders. By his personal example, the squad leader carries his whole squad forward to the assault."

Paragraph 58(2): "In this penetration, the entire squad attacks or fires simultaneously." Here we have the squad leader leading the assault.

Paragraph 59: "The advance by individual riflemen—led by the squad and platoon leaders—turns into a general rush as soon as the friendly fire shows effect upon the enemy."

In short, according to the foregoing, the qualifications which must be "hammered" into the minds of the squad leader as well as the second-in-command are as follows: (a) The squad leader must lead his squad, whose advance is covered by fire, expertly and swiftly, basing his movements on an accurate estimate of the terrain, which is essential to a full exploitation of the ground. Looking and rushing ahead, he advances his men by bounds from cover to cover, though without opening fire and careful not to draw hostile fire upon his squad, and "filters" his men through the terrain as rapidly and as far forward as

possible, until, finally, the lack of cover or supporting fire permits no further advance without a fire action. However, this training must teach and impress upon the squad leader the fact that the moment at which his squad must open fire does not arrive with the sound of the first hostile bullets. (b) In order to be able to lead his squad properly in the fire fight, the squad leader again must take full advantage of the terrain. He must know the possibilities of the supporting aviation, tanks, artillery, and heavy infantry weapons as well as adjacent units, and make use of that support at all times in speeding the advance of his squad. He must exploit weak spots of the enemy, by dashing forward immediately and so gain ground swiftly. In other words, in order to execute his mission successfully, the squad leader throughout the action must take into consideration the advantages and disadvantages of the terrain; the fire power of his squad, which must open fire with surprise effect; the situation of the adjacent elements; the supporting fire; and the changes in the hostile maneuvers. Therefore, in training the squad leader, the platoon commander must not require him to make lengthy tactical decisisions, nor ask him to issue his first orders until he has stated how he intends to carry out his assignment - with due consideration to the terrain - that is, until the squad leader has expressed himself on the technical aspects of his plan of action. The required plan of action then is stated to the squad in brief, yet clear, military orders: "First Squad will advance as follows. . . . . " The rules to be applied in judging the effect of the various infantry weapons (flat trajectory and high-angle weapons) are clearly explained to the squad leader in Chapters 3-17, H. Dv. 130/9; and the methods of taking into account (plan of action) the influence of the terrain on the various tactics of the infantry are summarized in Chapters 23-31 of the same regulations. Each new day of training must demand and teach this: "Proper exploitation of the terrain increases the fire effect, saves strength, reduces the number of casualties, and helps to achieve surprise effect." All teachers of the art of war emphasize the decisive influence

of the terrain upon the formulation of a practical plan of action. "Frequent practice," Frederick the Great demands of all military leaders, "must teach the leader to recognize at the first glance (coup d'oeil) all advantages offered by the terrain." Even the squad leader must be regarded as a military leader in this sense.

(2) The members of the squad, as a training unit, must learn a number of things that are based on their individual combat training. Before taking up that instruction, the platoon commander must review over and over the most important paragraphs of the regulations covering this phase of training. Those paragraphs are: H. Dv. 130/2a, Paragraph 284:

"If the hostile fire is effective, the advance must be supported by friendly fire. This supporting fire will serve its purpose only if it is exploited for a rapid and determined advance. Therefore, close mutual relationship between fire and movement is essential".

Paragraph 285:

"If possible, the advance should be made from cover; and full advantage should be taken of the terrain. The less cover a terrain offers, the more important it is to dig in rapidly and the stronger must be the fire supporting the advance.[2] The machine guns must protect the troops while digging in until the necessary cover is established".

Paragraph 73:

"Even during the critical phases of combat, the soldier must follow closely the instruction governing the use of his weapon and behavior in combat. That includes: Exploitation of the terrain, for the purpose of increasing the effect of the fire and providing cover; proper selection of the rallying point; careful sight-setting, aim and trigger squeeze; constant attention to the leader and the enemy; and a proper expenditure of ammunition".

Even more emphatic are the demands made in Paragraph 62a, Memorandum of October 13, 1939: "The object of the fire fight, namely the achievement of fire superiority,

(2) This differs somewhat from our method of training.

calls for rigid fire discipline. This is expressed by the selection of the fire position of the individual rifleman; the adjustment of the soldier in the fire position ('concealment, though fire effect is more important than cover'); sight-setting; selection of the target; opening of fire; fire distribution; and expenditure of ammunition. Thus fire discipline is the prerequisite for the success of the fire action. Fire discipline must be maintained even though the men have undergone strain and are tired." In conclusion, we shall quote from several other paragraphs of the Memorandum, October 13, 1939:

Paragraph 39: "If conditions are favorable for the delivery of effective fire, or available cover is inadequate, the riflemen enter into the fire fight at an early moment. The greater part of the riflemen are placed in the front line and open fire not later than the moment at which the assault elements form for the penetration of the hostile lines."

Paragraph 41(3): ". . . Hence the riflemen usually conduct the fire fight independently, within the framework of the squad . . ."

Paragraph 45: "The squad works forward in loose, irregular formation . . ."

Paragraph 49: "Before and during the assault, all weapons are fired on the enemy at the highest rate of fire. The light machine gun accompanies the assault, firing while moving forward. The final resistance of the enemy is broken by charging him with the hand grenade, submachine gun, rifle, pistol, shovel, and shouts of 'hurra.' All men participate in the hand-to-hand fighting . . ."

II. The Preparatory Work of the Platoon Commander

Preparatory to training the squads in combat methods, the company commander instructs the platoon commanders and platoon sergeants. He prepares in advance a training schedule for the period which the battalion commander has allotted for squad training—a period which, of necessity, is short in time of war. By giving his instructions in the field as well as at the sand table, the company commander assures uniformity of the work within the company. It is

well to begin this preparatory course of instruction while individual training is still in progress, so that squad training may proceed at full speed from its inception. A well-organized training schedule will provide the time required for that purpose. Demonstrations held by the company commander personally and performed by noncommissioned officers acting as the training unit are the most effective means of showing the platoon commanders how the company commander expects the squads to be instructed. Therefore, the company commander, himself, decides what problem will be conducted each day. The purpose of the training must be perfectly clear in the minds of all; and the individual problems must be confined to the execution of small phases of the various tactical methods (attack, defense, combat in special areas). However, care must be taken not to practice the attack one day and the defense the next without adhering to some system. Closely defined training phases are, for instance:

(a) The attack from medium to close distance.

(b) The attack from the point at which the assault is launched to the penetration of the hostile resistance and maintenance of the captured position. Here, early use must be made of loaded hand grenades, flare pistols, and wire clippers.

(c) The attack from hand grenade range, assault, and defense against a hostile counterattack. Again, early use of loaded hand grenades is essential.

(d) Action in the main combat area. This phase of combat must be emphasized; and maximum use must be made of loaded hand grenades.

(e) Combat of outposts.

One squad problem should not combine too many of these phases. The result would be that mistakes would not be corrected; and the benefits derived from the exercise would be nominal. Generally, training should be based mainly on actions in which both flanks rest on adjacent elements.

The preparatory work of the platoon commander commences in the office and in the field. By no means may squad training be "improvised".

(1) Preparatory instruction in the lecture hall must precede all training in the field. Training manuals, charts, and the sand table must be used to teach the platoon the combat principles and doctrines that are essential to the accomplishment of the given mission. It is important to imitate as closely as possible the true conditions of warfare. "What is taught and practiced in the field must be prepared, mentally absorbed, and confirmed through theoretical instruction".

This theoretical instruction must not be given in a narrow, schoolmasterly fashion, but must be animated and rendered interesting. It is addressed simultaneously to the squad leaders and their men, teaching them clear conceptions (combat principles) with the aid of examples taken from actual experiences in war. It presupposes that the platoon commander be thoroughly familiar with the contents of the training manuals (see Chapter I), especially with those of H. Dv. 130/2a and b, H. Dv. 130/9 (Command and Combat of the Infantry), as well as H. Dv. 240 (Musketry). "Mental absorption and a thorough command of the subject of instruction on the part of the instructor are essential to successful instruction." The instructor must be able to visualize clearly the course of an infantry action. The platoon commander must take this theoretical instruction most seriously; he will reap his reward later in the field. The use of training films facilitates the work of the instructor. In preparing himself for a period of instruction, the platoon commander must compile, in brief form, the paragraphs of the regulations which he will use.

(2) The preparatory work in the field includes the selection of a suitable area offering a large variety of terrain features, that is, a terrain which permits of a continuous development of the given problem and corresponds as nearly as possible to the nature of the tactics employed.

Such a terrain is called an "instructive terrain," for it brings out clearly the object of the exercise. For instance, training the squad in the defense calls for a terrain which offers a wide field of observation and permits the delivery of effective fire into the hostile zone. Or, if the squad is to

practice combat of outposts, the instructing platoon commander must not only select a suitable terrain in front of the outposts, but one which is suitable also in their rear. In other words, the terrain must permit a covered withdrawal of the outposts; and its conformation must be such as to enable them to resume action, that is, to go into position and deliver effective fire, at every favorable terrain feature, while falling back on the MLR. The departure area of the squad should offer cover against observation and, preferably, also against hostile fire (woods and thickets, natural boundaries, depressions behind hills). For the attack itself, rolling terrain is most suitable; and small cover, such as thickets, woods, hedges, and barns are highly desirable.

Therefore, extreme care must be exercised in the reconnaissance of the terrain; and the zone of action must be checked from "A" to "Z", beginning at the starting point of the exercise and ending at the objective. The platoon commander must walk the entire distance, not ride or drive; again and again he must lie down on the ground and examine the area through the eyes of the enemy. In that manner, the platoon commander acquaints himself thoroughly with the place for the initial situation, the zone of action, and the position of the enemy. A general outline of the plan of the exercise thus takes shape automatically. Terrain features should not be assumed. It goes without saying that all who assist in the conduct of the exercise, the enemy leader, those who represent adjacent elements, and so forth, accompany the platoon commander on this preparatory ground reconnaissance. The occasional participation of a machine gun or heavy weapons officer, as adviser to the instructor, may be of great service. Important, further, is the time of day at which the platoon commander chooses to work in the field. The squad must not practice only in the clear morning hours. On the contrary, it should work also in the dawn of the day, in the full glare of the midday sun, in the dull light of the afternoon sun, and in the mist and dusk of the sinking day. It must be remembered that the constant changes in visibility have a

tremendous influence upon the conditions of observation and combat. It is suggested that the platoon commander conduct one and the same problem several times at various hours of the day. He will readily find that the difference in illumination will favor now one side and then the other, depending upon the direction from which the light comes.

(3) The formulation of the plan of action divides itself into three phases:

(a) The establishment of the initial situation, which covers the sphere of action of the platoon as the next higher unit, must be brief and simple; contain the combat mission assigned to the squad; and describe the situation as it exists at the outset of the action. Here, as in all military training, simplicity is of primary importance. The initial situation in any case must state: The hostile situation; the mission of the platoon; the location and organization of the squad and adjacent elements at the time being; the mission of the squad; support by artillery and heavy weapons; and the position of the platoon commander, in his capacity of leader of the next higher unit. The description of the general initial situation gives the squad leader and his men a clear picture of the existing situation, with regard to fire and air activity. Good, complete platoon orders, assigning the squad a definite mission and placing it into the midst of a combat phase, are a valuable springboard for the squad at the outset of the exercise.

(b) The plan of action must be based on the terrain, the effect of the friendly and hostile fire, the gains made by the simulated adjacent elements, and so forth. Its text must show, both as to time and place, the progressive development of the assumed fires and situations; the use of flags to represent fires; the employment of smoke producers, blank charges, tear and sneezing gases, and roadblock signs; the arrival of messages and orders; the occurrence of casualties; the falling out of the squad leader and light machine gun; cooperation with heavy weapons; the appearance of friendly and hostile aircraft; the use of smoke screen and the gas mask; and the progressive maneuvers of the enemy, demonstrated by prearranged sig-

nals (see c). Aircraft that happens to fly overhead must be included in the problem as either friend or foe. Nearby units may be requested occasionally to lend certain weapons, as, for instance, a tank with which to give a clear demonstration of the vital cooperation between infantry and tanks. An automobile may be transformed readily into a dummy armored car with the aid of pasteboard. One must be inventive and possess a good deal of imagination. During squad training, the men of the rifle squad should be introduced to heavy machine guns as often as possible; they should actually fire and not merely "assume" them. This will help the machine gunners, too. Field telephones and blinkers should be used frequently on problems, in order to prevent the unnecessary and careless "sacrifice" of runners—which is a common mistake. Unfortunately, the effect of the hostile artillery fire cannot be truly represented by smoke producers and blank charges. For instance, it is difficult for the ear to imagine the swishing noise of the approaching shell. Therefore, a vivid, plastic description by the instructor is most essential in that connection, in order to enable the squad leader and his men to draw an approximately realistic picture of the physical and moral effect of the hostile artillery fire. It is advisable to prepare a simple sketch of the exercise area, drawn according to scale and with exact distances shown. The progressive course of action as planned should be indicated briefly on the margin, according to terrain features and boundaries. The sketch must show dead spaces, scheduled target areas, zones covered by friendly and hostile aircraft, wire entanglements, mine barriers, and gas zones.

(c) The enemy leader is the most important assistant of the instructor. He must be informed of the location and strength of his disposition which must conform to the conditions of actual warfare. He must be given an active assignment. For instance, an alert private first class, functioning in that capacity, may be given a corresponding reconnaissance mission. The platoon commander later should examine the execution of that mission and make necessary changes. An enemy on the defensive must not be installed

too obviously in the terrain, in order to accustom the eye of the soldier to recognizing a well built in and camouflaged opponent who will present only momentary targets. The enemy must avoid congestions. The strength, armament, and equipment of the enemy must be represented by full-strength troops; if necessary, these may be supplemented by flags and silhouette targets only to a degree corresponding to the object of instruction. For example, if the squad is to execute a successful attack, the enemy must not be of equal strength; and his fighting power must gradually weaken, in order to permit a successful assault. Similarly, if the squad is fighting in the main combat area, the enemy must be gradually "stunned," so that the attacking squad may finish him off with the hand grenade and bayonet.

On the other hand, in defensive training, the squad must be attacked by superior hostile forces. In other words, the strength of the friendly and hostile forces must be weighed carefully against each other.

The instructions issued to the enemy and his disposition are of extreme importance and require thorough planning and preparation on the part of the platoon commander. The enemy leader must be given a combat assignment; and it is best to confine him to definite actions, corresponding to the plan of the exercise. The enemy shows himself and fires (delivering either strong or weak fire or none at all, at first) at the time and place directed by the platoon commander. The enemy digs in, conceals himself, ceases fire, and screens his position by smoke to represent artillery fire on his position, in conformity with the plan of action. In the case of fire delivered by a hostile heavy machine gun, for instance, the instructor and his assistants use flags or a few words to indicate the area covered by that fire, showing whether the squad, itself, or some adjacent element is the target of the hostile machine gun. If engineer units are located in the vicinity, material may be borrowed occasionally to install blasting charges along the entire breadth of the hostile position and set them off by means of electricity. The fountains of earth rising into the air at the moment directed by the platoon commander will give a

vivid illustration of the effect of the artillery fire on the enemy. It must be remembered that the spoken words of the instructor and his assistants remain but an expedient, a substitute for actual warfare conditions. Hostile artillery fire on the zone of action of the attacking squad may also be demonstrated in the manner described above. Communication with the enemy leader, required by the platoon commander for the purpose of making real the action of the enemy, is established best by means of prearranged signals (flags). At any rate, this method of directing the enemy is better than to agree on certain hours and minutes at which to carry out certain functions; for, once the platoon commander interrupts the development of the problem by explanations and inspections, the time schedule is broken and confusion will be the result. Telephone and radio communication between the two sides help the platoon commander to maintain firm control over the exercise at all times. An atmosphere of true warfare conditions must pervade all of these measures. The enemy should fire blank cartridges. Finally, the platoon commander must have a clear idea of the time required for the execution of the problem.

III. The Practical Work of the Platoon Commander as Instructor.

Once the platoon commander has prepared a written plan of the exercise, he distributes copies of it (indicating situation and plan of action) to his assistants and, in addition, furnishes the enemy leader a memorandum containing a number of questions which the enemy leader must answer during the exercise according to his observations of the squad under instruction. In this manner, the platoon commander gathers valuable data for his critique, for it is the only means of informing him what the enemy has observed—a factor of great importance for the critique. The day on which the problem is to be held, the platoon commander orders the elements representing the enemy to precede the unit to the training area and establish themselves in their defensive positions. Thus two things are

accomplished at one and the same time: no time is wasted in the field; and the establishment of the hostile position remains concealed from the squad under instruction.

The platoon commander then proceeds with the execution of the squad problem according to the following method of instruction, always stressing thoroughness in execution:

(1) The platoon commander describes the initial situation clearly to the squad leader on the spot, speaking loudly enough for all men to hear him. He must learn to speak in the manner of the radio announcer who describes the dramatic course of a sporting event.

(2) The squad leader repeats the description of the initial situation. Doubts must be clarified.

(3) The platoon commander directs questions to the various men of the squad, so as to make sure that all men understand the situation. Next, he orders the squad leader: "Move into departure position under peacetime conditions."

(4) The squad leader orders his men to take up the departure position: "Our squad now will form as follows . . ." The departure position may be taken up also in the following manner, for example: "First squad, position behind this rise. Squad will face as I am now facing. As skirmishers." Next: "Full cover." Or: "First squad, position behind this slope. Light machine-gun crew on the left, riflemen on the right, of the road. As skirmishers." Then follows an inspection of the departure position by the platoon commander. It is imperative that the movements are executed precisely as ordered.

(5) The squad leader develops the plan of action, in conformity with the mission assigned to him by the platoon commander. Care must be taken to grant the squad leader time enough to make deliberate decisions—a factor which is often disregarded. Even in war, there is usually time enough to deliberate. Undue haste easily leads to reverses. The progressive training in combat technique will teach the squad leader early enough to make lightning decisions when taken by surprise.

(6) Warfare conditions are assumed upon a whistle signal of the platoon commander or a bugle signal.

(7) The squad leader issues his first orders expressing the plan of action. The instructor must give the squad leader time to put his initial instructions into effect.

(8) The situation of the squad within the framework of the platoon develops as planned. The exercise may be interrupted whenever necessary to discuss the phases executed at the moment. The pauses are announced by bugle signal and conducted under peacetime conditions (which is indicated by having the men remove their steel helmets). This method of interrupting the exercise for brief discussions is recommended especially for the first period of squad training, in order to evaluate the impressions of the action while they are still fresh in the minds of the men; and to ascertain the "wrong" and the "right" of the orders issued by the squad leader and the conduct of the men, so that everybody—down to the last "buck-private"—will be able to understand the situation. The fire fight should be interrupted frequently and the men ordered to aim at the targets on which they have last fired. While this is being inspected, attention must be given to the setting of the sights. A hurried development of the exercise is harmful to the training of the squad.

(9) Conclusion of the exercise. The squad leader reports to the platoon commander: "Rifles unloaded. Light machine gun unloaded, released, and locked."

(10) The squad leader forms his squad and reports it to the platoon commander. The platoon commander, after a brief discussion with his assistants and the enemy leader, holds the critique at a place which affords a good field of view. His review of the problem proceeds in the following order:

(a) Purpose of the exercise.

(b) Brief description of the situation on both sides.

(c) Mission of the squad.

(d) Brief, yet clear summary of the course of the exercise (no long-winded talk).

(e) Judging the conduct of the squad leader as the "foremost fighting man" and actual leader of his squad, stressing his plan of action, measures taken and orders

given in the execution of the problem. Has the squad leader correctly limited himself to issuing brief, calm and definite orders; and has he led his squad, as much as possible, by personal example and signals (for instance: to follow, jump, rush forward)? Did the squad leader exercise fire control; and was it noticeable, Was the hostile area under constant observation (visual reconnaissance)?

(f) Judging details, with regard to the conduct of the riflemen and light machine-gun crew:

For instance: Did the men adhere closely to the prescribed direction of attack?

Did the men hold their heads high, eyes focused upon the squad leader and the enemy, while advancing?

How was the ground exploited during the advance? Was camouflage used?

How did the men go into position? Did they use their intrenching shovels? (The shovel occupies a place also in the attack, for a good and timely use of the shovel is a lifesaver and helps to maintain the fighting power of the squad. To quote from the German Infantry Journal, April 1939, where a company commander says: "The soldier who digs fast gets more out of life.)[3]

How did the squad behave during the fire action? How was the fire discipline in general? Did the squad open fire earlier than necessary? Did the men remember to change their sights during the forward displacement?

Did the men guard the muzzles of their rifles?

Were stoppages of the light machine gun eliminated under cover?

Did the men expose themselves and present targets to the enemy unnecessarily?

How did the men behave under hostile artillery and machine-gun fire, during the gas barrage, and in the presence of hostile aircraft? Did they make use of the gas tarpaulins?

Did the men avoid congestion in the zone of hostile fire?

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(3) This differs somewhat from our method of training.

Did the squad take advantage of the protective fires of the adjacent elements, friendly artillery, and heavy weapons and move forward with lightning speed and determination? The main thing is to teach the men to rush forward.

At what points were long, and at what points short, rushes in order?

Could losses of men, arms, and equipment have been avoided? If so, how? (This is important). How is the ammunition expenditure estimated, based on Paragraph 269. H. Dv. 130/2a and Paragraph 51, H. Dv. 130/9? Did the men think of taking the ammunition of the "wounded" and "dead"? This point must be watched closely even in peacetime training.

Was the fire throughout aimed mainly at those targets which obstructed the execution of the mission most of all? (Ammunition tactics.)

(g) What outstanding mistakes were made? What was done especially well? Here, the instructor must pay recognition to efforts made, thus spurring the men to make further efforts. This method of schooling has always been successful; it stimulates the interest of the men in their work and strengthens the self-confidence of the squad leader and his men. Each day of training must be a day of schooling which leaves the trainees with a feeling of deep satisfaction at the end of their day of hard training. Therefore, the question is: What lessons have been derived from the exercise?

(h) Discussion of the question, whether the purpose of the exercise has been achieved and the mission accomplished. All participants, including the assistant instructors, the leader of the enemy and his men, attend the critique. The company commander, inspecting one platoon one day and another the next, has an opportunity here to clarify doubts.

The critique calls for clear thinking, a soldierly manner of speech, and constant training on the part of the platoon commander and instructor. While the critiques, in the beginning, must be quite explicit, they may become briefer and confine themselves to the most essential points as the

training progresses. The less use the speaker makes of written notes, the greater an impression will he make upon his audience. Even the young officer must practice speaking without the aid of notes. A written summary of the exercise is read later in the lecture hall.

If the schedule of squad training, as described above, is pursued in a thorough manner, the company commander will derive genuine pleasure from the platoon and company training. The more personal attention he pays to the training of the squads, the greater will be his success in turning his company into an effective weapon. It goes without saying that the platoon commander must work hard in training his squads. Nothing will be "handed him on a silver platter"; on the contrary, he must work for it and occasionally sacrifice a Sunday to ride over the exercise area and work out his problem undisturbed. If he goes through his work thoroughly from top to bottom, he will be a "seasoned hand", so to speak, the next time. Tedious though this work may be, attention to details will be rewarded.

In conclusion, it may be well to bring to the mind of the instructing platoon commander Paragraph 2, H. Dv. 130/9 (Command and Combat of Infantry). The words may serve him as a guide and spur in his work:

"The infantry carries the main burden of combat and is called upon to make the greatest sacrifices. In return, it reaps the highest glory.

"The power of the infantry consists in its spirit of the offensive. It is that spirit which the infantry, confident of its inherent strength, must foster. Its combat must be dominated by one will: FORWARD, STRAIGHT AT THE ENEMY."

CHAPTER 4

The Infantry Battalion, Rifle, in Defense

(ILLUSTRATIVE PROBLEM)

(AN INFANTRY SCHOOL TEACHING)

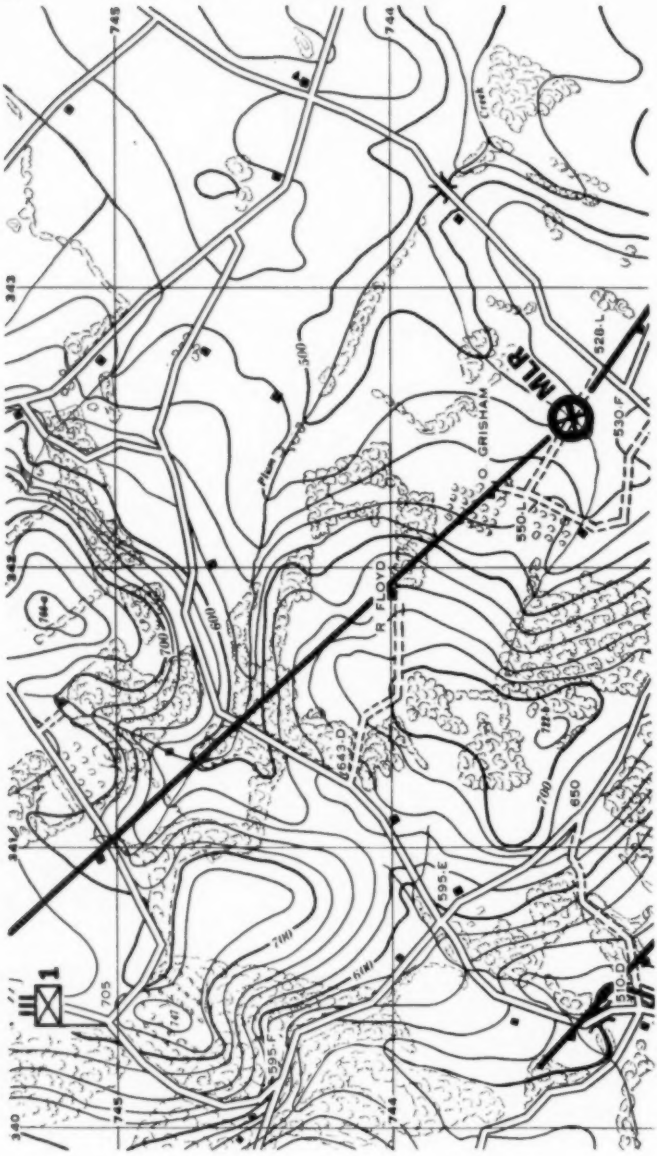
SITUATION

Following a night march of fifteen miles, the 1st Battalion 1st Blue Infantry, 1st Division, part of a larger force, occupied a concealed bivouac 2½ miles northwest of CR 595-E (40-43) just prior to daylight (5:50 AM) September 9th. All weapon carriers and transportation organically assigned to the units of the battalion are concealed with their units in the bivouac area. The battalion medical section and the battalion section communication platoon headquarters company marched with, and are bivouacked with, the battalion. Local security has been provided for the bivouac area and the battalion antitank platoon and the caliber .30 machine-gun platoons of Company D are in position to furnish antimechanized defense and antiaircraft security for the bivouac. The bivouac outpost for the 1st Division is provided by the 2d Infantry. The corps cavalry regiment is reconnoitering to the south and east.

Red has a powerful air force which up to the present time has been engaged primarily against the Blue air force and communications.

At 10:30 AM, a messenger from Colonel 1st Infantry delivered the following message and two copies of an operation map (shown in part on Map A) to Lieutenant Colonel 1st Battalion.

> The 1st Infantry occupies a defensive position at once in connection with units on our right and left.


748
744
343
MLR
528-L
530-F
O GRISHAM
550-L
R FLOYD
643-D
595-E
650
700
710
705
745
340

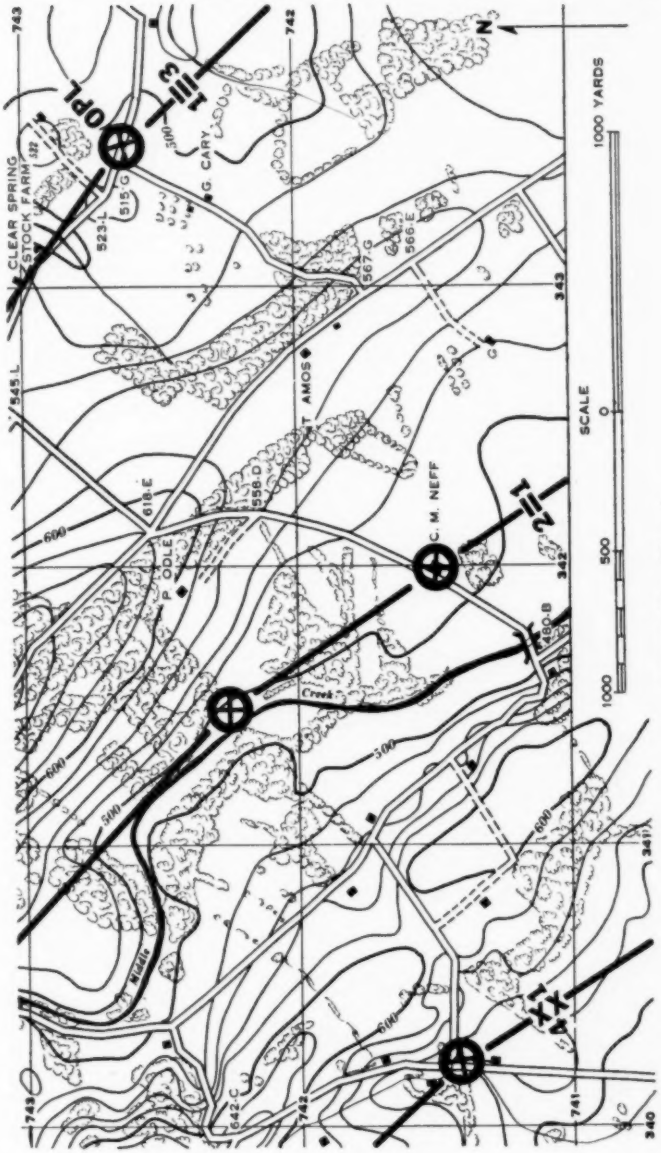


FIGURE 20.—Map A.

For boundaries, and limiting points, see operation map (Map A), herewith.

You will report at 10:45 AM at RJ 650 (41-43) to receive the regimental defense order.

After reading the message, Lieutenant Colonel 1st Battalion handed Major Executive—S-3 one copy of the map and directed him as follows:

"You will alert the battalion at once and be prepared to start it forward promptly via covered routes upon receipt of march objectives.

"I am going at once in my command car to report to the regimental commander at RJ 650 for orders. I want Lieutenant S-1—S-2, a radio operator with an SCR-195 radio set, Staff Sergeant Topographical Draftsman and a messenger to accompany me.

"Have Captain Company D, Lieutenant Reconnaissance Officer Company D, Lieutenant Antitank Platoon Company D, Lieutenant S-4, Lieutenant Communication Officer, and Captain Battalion Surgeon report at the road bend 250 yards northwest of RJ 650 at 11:00 AM."

Upon his arrival at RJ 650, a regimental staff officer met Lieutenant Colonel 1st Battalion and informed him that the regimental commander was on Hill *722-b*, which he pointed out, and would issue his orders at that point.

Lieutenant Colonel 1st Battalion directed Staff Sergeant Topographical Draftsman, "Go back to the first road bend and meet the officers who have been directed to report there at 11:00 AM. Conduct them to the southern edge of those woods" (Pointing to the woods just north of the crest of Hill *722-b*.) Lieutenant Colonel 1st Battalion and the remainder of his party then proceeded across country in the command car to Hill *722-b*.

After the battalion commanders, regimental staff officers, and commanders of the headquarters and antitank companies had assembled on Hill *722-b*, they were oriented on the ground by a regimental staff officer. Colonel 1st Infantry then issued his oral defense order, extracts of which follow:

Blue covering forces are delaying the advance of a Red force of several divisions from the south. Advance hostile detachments are not expected to reach our defensive position before late this afternoon. A coordinated attack is not expected before tomorrow.

The 1st Field Artillery Battalion (105-mm howitzer) is in direct support of the 1st Infantry. One artillery normal barrage is allotted to the 1st Battalion and two to the 2d Battalion. One emergency barrage is allotted to each forward battalion.

For units on our flanks, see operation map (Map A).

This regiment will organize and defend the sector shown on operation map. For assignment of forward battalions, boundaries, and limiting points, see map. (Shown in part on Map A.)

One platoon of the antitank company will be emplaced in the area of the 1st Battalion and * * * *

The 3d Battalion will organize the regimental reserve area. It will prepare counterattack plans in accordance with directive to be issued later.

Priority of organization after the location of combat emplacements has been fixed: Clearing fields of fire to include removal of obstacles masking observation, construction of individual shelter and emplacement for supporting weapons, and construction of obstacles. Works will be camouflaged as they progress.

One truck of antitank mines (500) is allotted each front-line battalion.

Front-line battalions will establish combat outposts.

Administrative details later.

Command Posts:

1st Infantry: Operation map.

Battalions: To be reported.

By 11:00 AM the officers who were directed to come forward have joined Lieutenant Colonel 1st Battalion on the northern slope of Hill *722-b*. An artillery liaison officer has also reported.

FIRST REQUIREMENT

1. With what officers, present at the issuance of the regimental defense order, should Lieutenant Colonel 1st Battalion confer prior to leaving the vicinity, and what should he discuss with each?

2. Prior to the issuance of any instructions to subordinates or staff officers, or before leaving on reconnaissance, what preliminary steps in troop leading should Lieutenant Colonel 1st Battalion take?

3. What basic decision relative to the disposition of his command on the position should Lieutenant Colonel 1st Battalion make at this time?

4. Having made this basic decision, what steps should Lieutenant Colonel 1st Battalion take to expedite the movement of his battalion onto the defense position and to ensure prompt issue of the battalion defensive order?

5. What route should Lieutenant Colonel 1st Battalion follow on his reconnaissance?

6. Who should accompany him on his reconnaissance?

7. What duties or instructions should he give at this time to those members of his staff, if any, who are not to accompany him on his reconnaissance?

8. Where and at what time should he issue the battalion defense order?

A SOLUTION OF FIRST REQUIREMENT

1. Lieutenant Colonel 1st Battalion should confer with the following officers:

a. Lieutenant Colonel 2d Battalion: Discuss coordination of the defense on the boundary between battalions. He should arrange to meet him at some specified hour, near the limiting point on the main line of resistance after each has had an opportunity to look over the ground.

b. Lieutenant Colonel 3d Battalion: Request him to send an overlay of any portion of the organized position of the reserve battalion that will affect the organization of the 1st Battalion area. He will want to know in particular:

(1) Will the 3d Battalion be able to support any portion of the 1st Battalion area by fire?

(2) If a flank line of resistance is to be organized by the 3d Battalion on the left side of the regimental sector, how far forward will it extend?

c. Major S-3 1st Infantry: Request information relative to disposition of unit assigned the area on his left.

d. Artillery Liaison Officer: Request that he be prepared to accompany him on his reconnaissance.

2. Prior to issuing instructions to subordinates or staff officers and before leaving the vicinity where he received the regimental defense order Lieutenant Colonel 1st Battalion should make a map study in order to—

a. Make a tentative defense plan.

b. Plan his reconnaissance.

3. Having made his tentative defense plan Lieutenant Colonel 1st Battalion should decide upon the assignment of his three rifle companies to areas on the defensive position.

4. Having decided upon the general assignment of his rifle companies, Lieutenant Colonel 1st Battalion should contact Major Battalion Executive—S-3 and advise him of this decision, and direct him to—

a. Designate company assembly positions in the respective company areas, and march the companies thereto via covered routes.

b. Send the platoon leaders of the .30 caliber machine-gun platoons and the 81-mm mortar platoon, and the rifle company commanders forward to meet the battalion commander at 12:15 PM at the point where the road running southeast from RJ 650 leaves the woods.

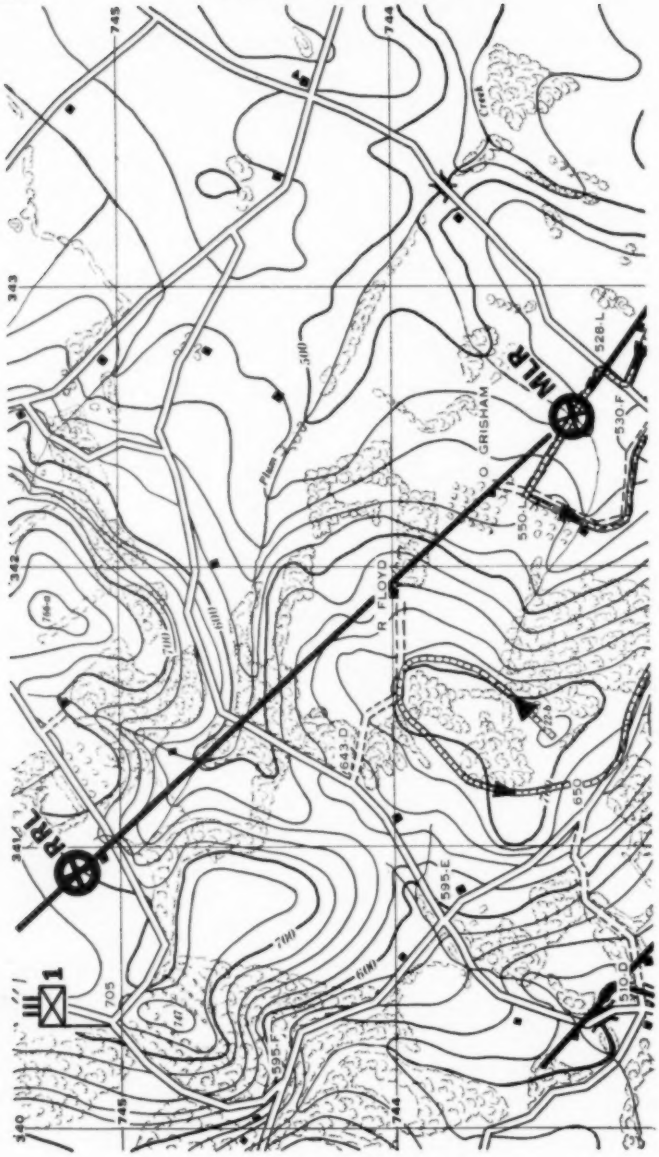
These instructions should be transmitted to the executive over the SCR-195 radio set either by the battalion commander in person or, preferably by Lieutenant S-1—S-2.

5. See Map B.

6. Captain Company D, Lieutenant Artillery Liaison Officer, Staff Sergeant Topographical Draftsman, the radio operator, and the messenger should accompany him on his reconnaissance.

7. Lieutenant Colonel 1st Battalion should give those officers who are not to accompany him on his reconnaissance the following instructions:

a. Lieutenant Reconnaissance Officer, Company D: Check the possibility of long-range fires from the vicinity of this hill; look for suitable position areas for the 81-mm mortars; contact the battalion commander of the unit on our left and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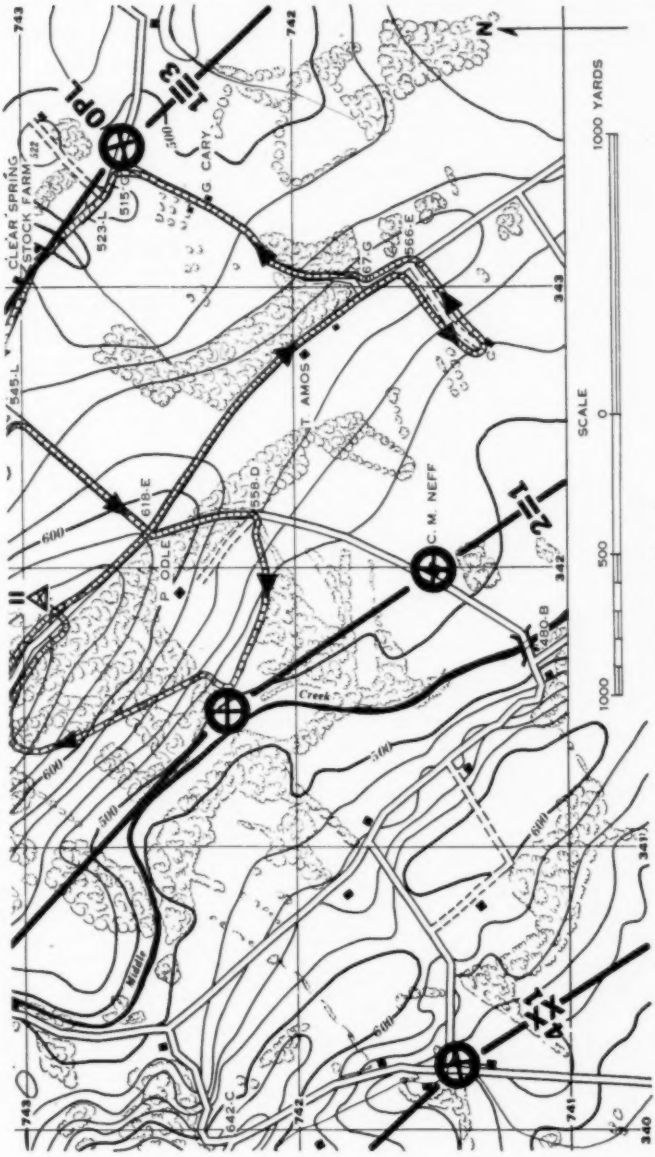


FIGURE 21.—Map B.

arrange with him for the coordination of fires across the boundary in the vicinity of the limiting point; reconnoiter and report on Plum Creek as a tank obstacle from a point 800 yards above the bridge at (43.3-43.8) as far forward as the stream junction below the bridge.

b. Lieutenant Antitank Platoon Company D: Reconnoiter Middle Creek as a tank obstacle from CR 510-D (40-43) to the bridge just east of RJ 480-B. Report on the characteristics of the creek and the woods along the creek and in front of the position from the creek to CR 618-E. Be prepared to make recommendations for the location of your guns and suitable areas for the employment of the antitank mines.

c. Lieutenant S-1—S-2: Select a location for the battalion observation post. Reconnoiter with Lieutenant Communication Officer and select a location for the battalion command post, in the vicinity of RJ 643-D, arrange for its installation, and report its location to the regimental commander.

d. Lieutenant Communication Officer: You will reconnoiter with Lieutenant S-1—S-2 for a suitable location for the battalion command post and proceed with the installation of communications.

e. Lieutenant S-4: Reconnoiter and let me have your recommendations for the battalion ammunition distributing point, the release point for the battalion section of the kitchen and baggage train, and the kitchen bivouac, if the kitchens are to remain forward tonight. Contact Regimental S-4 and ascertain the location of the regimental ammunition distributing point and information relative to the stocking of ammunition on the position.

f. Battalion Surgeon: Reconnoiter for a location for the aid station.

g. To all the above officers, with the exception of Lieutenant Communication Officer: Meet me at the point where the road leaves the woods about 700 yards southeast of here by 12:00 noon.

8. Lieutenant Colonel 1st Battalion should issue his defense order in the edge of the woods near (41.9-42.85) not earlier than 12:00 noon or later than 12:30 P. M.

A DISCUSSION OF FIRST REQUIREMENT

In any situation, if a commander is to have with him the staff officers and enlisted assistants whom he will need, together with the necessary transportation and communication facilities for the control of his unit, he must take positive action relative thereto prior to leaving his command post to go forward to receive orders. Normally, when the battalion commander goes forward to receive a regimental defense order he is accompanied by a staff officer and the company commander of the heavy weapons company. In this situation, since the battalion is now in bivouac and must be alerted and formed prior to starting a movement forward, it is believed that Captain Company D initially can be employed more advantageously if he is allowed to remain with his organization temporarily.

In order to ensure that the troops will have the maximum possible time to improve their position, the Executive Officer—S-3 is directed to alert the battalion and prepare it to start its forward movement as soon as definite march objectives are determined. Depending upon the state of training of the unit and their arrangement in the bivouac, this should take from 15 to 30 minutes. Since Red has a powerful air force, the movement to, and the the occupation of, the defensive position should be made under cover of darkness if possible. Since the advance of the hostile ground forces makes this delay impossible, every possible use should be made of available cover in order to avoid observation by hostile aviation and to preserve secrecy with respect to the location of the defensive position.

The battalion commander should arrange to have some means of communication with his organization. Since the distance involved is well within the range of SCR-195 radio

set, this means is adopted rather than by employing one of the ¼-ton trucks from the message center section of the battalion.

The commanders and staff officers whom he will use to assist him on his reconnaissance, have numerous duties to perform in connection with the start of the movement of the battalion. Therefore, Lieutenant Colonel 1st Battalion decides to take only Lieutenant S-1—S-2 with him when he goes forward to receive orders. He directs that the remainder of these officers report at the road bend north west of RJ 650 at 11:00 AM, and later arranges to guide them to the point where they are to meet him. This will allow them approximately 15 minutes to make necessary arrangements before they leave the bivouac area.

In troop leading, the commander must keep constantly in mind the transportation available, together with the passenger carrying capacity of each vehicle. Each command car has a capacity of four, and each ¼-ton truck a capacity of three in addition to the chauffeurs. Any standard loading arrangements for these vehicles will require frequent adjustments to fit the particular troop leading situation. In this situation Lieutenant Colonel 1st Battalion takes the command car and one ¼-ton truck with his party. Major Executive—S-3 will have available the other ¼-ton truck assigned to Battalion headquarters. Lieutenant Detachment Commander and Battalion Transport Officer will probably require one of the two ¼-ton trucks in the message center, leaving one of these trucks available at the message center as a messenger vehicle. Of the officers who were directed to report at RJ 650 at 11:00 AM, Captain Company D is provided with a command car, and Lieutenant Reconnaissance Officer Company D, Lieutenant Antitank Platoon Company D, Lieutenant S-4, Lieutenant Communication Officer, and Captain Battalion Surgeon are each provided with a ¼-ton truck.

When a regimental order is issued orally to assembled battalion commanders and staff officers, there will be numerous points which may be settled quickly and much

information which may be mutually exchanged between members of this group. Where this is done prior to the departure of the officers from the vicinity of the place orders are issued, valuable time will be saved.

From a map study Lieutenant Colonel 1st Battalion can determine quickly that the width of the battalion defense area will require two rifle companies along the main line of resistance. He is, therefore, in a position to make a definite decision as to the general assignment of his three rifle companies to defense areas and direct their march on them. From his study of the map, he is also able to select a tentative route for his reconnaissance and to determine what points he will be able to check personally and which ones he will assign to his various assistants. Any reconnaissance made without prior planning will undoubtedly take too much time or result in failure to obtain essential information relative to some of the critical areas.

Having decided the route of his own reconnaissance and which officers are to accompany him, Lieutenant Colonel 1st Battalion is in a position to assign reconnaissance missions to his staff officers. In each case the officer is given specific things to do which will provide the battalion commander with essential information and which will assist the officer concerned in the performance of his normal duties.

At this time the battalion commander should also direct the preparation of operation sketches for the battalion order.

A complete system of signal communication is one of the advantages of the deliberate defense. The installation of such a system requires considerable time. Lieutenant Communication Officer and Lieutenant S-1—S-2 are most concerned with the selection and installation of the command post. By selecting a general area and directing that these officers jointly decide upon the exact location therein, and that Lieutenant Communication Officer then proceed with its installation, considerable time is gained.

There is no position for the issuance of the regimental order which affords good observation of the sector. From Hill *722-b* no observation of the forward part of the 1st Battalion area is possible. However, observation of the rear areas and of a considerable portion of the area of the right battalion is afforded from this hill.

Seeing that no observation of his area is possible from Hill *722-b*, Lieutenant Colonel 1st Battalion studies his map and selects the high ground where the road through the center of his area leaves the woods, for the issuance of his battalion order. This location affords an excellent view of the left of the position but none for the right. Following the issuance of the battalion order, he should move south to the edge of the woods near P. Odle and point out the right limiting point on the ground to Captain Company A.

The reconnaissance mission assigned to Lieutenant Reconnaissance Officer Company D may require more time than is available owing to the fact that there may be some difficulty in locating the battalion commander of the battalion on the left. Another solution would have been to direct Lieutenant S-1—S-2 to contact the battalion commander of the adjoining battalion and check the condition of the stream, and to permit Lieutenant Communication Officer to select the command post location.

The decision as to the time for the issuance of orders is influenced by: (1) the time necessary for Lieutenant Colonel 1st Battalion to make his reconnaissance and complete his plan, and (2) the time when the subordinate commanders who are to receive the orders can be present.

In any situation, whether on the ground or in solving a map problem, it is difficult to determine accurately the time required to make a reconnaissance. In this case, if we assume that the reconnaissance is made at the maximum speeds indicated in reference data (35 mph on roads and 8 mph cross-country), 23 minutes are required for movement. Having moved at these maximum speeds, the battalion commander must select several points at which he will stop momentarily in order to look over the ground. Assuming

that the conferences held, the preliminary planning, and the issuance of instructions on Hill *722-b*, were completed in ten minutes, which is doubtful, and allowing 10 minutes for the stops mentioned above, we find that the battalion commander can be back at Hill *722-b* by 11:43 AM at the earliest. Allowing 15 minutes for receiving the reports of his staff officers and the completion of his plan and notes for his oral order, we arrive at 12:00 o'clock as the earliest possible hour at which the battalion defense order can be issued, provided the indicated reconnaissance is made. In order to allow for some delays, which must be expected, 12:15 was set as the hour for issuance of the order.

By utilizing the ¼-ton trucks of the platoon leaders of Company D, these officers, together with the three rifle company commanders, can be brought forward ahead of their troops. Where practicable, each unit above the platoon should be represented by two leaders or staff officers, when oral orders are received. Likewise, officers reporting to receive orders should be accompanied by one or more messengers and such other personnel as they deside. The size of the party taken forward will frequently be determined by the transportation available. In this case probably only the rifle company commanders can be brought forward by motors with the three platoon leaders of Company D. Other personnel may be directed by the company commander to move forward individually and without delay to meet him at some designated point.

SITUATION, CONTINUED

During his reconnaissance, Lieutenant Colonel 1st Battalion noted the following.

1. Middle Creek is shallow, averaging not over one foot in depth, and has a firm bed. It would afford no obstacle to foot troops or track laying vehicles, and in most places, none to wheel vehicles.

2. The woods shown on the map are generally large trees averaging eight inches or larger in diameter, and about 40-50 feet in height, with the exception of the patch of

woods between RJ 558-D (42-42) and RJ 618-E (42-42) which are considerably taller, averaging between 80 and 100 feet in height. Except along the creek bottoms there is practically no underbrush, visibility being good up to 250 yards, and by avoiding large trees final protective lines can be cleared in them without excessive labor.

3. The open spaces are covered with short grass, weeds, and stubble, not over one foot in height.

SECOND REQUIREMENT

1. What areas afford covered approach to the position or which could be used to screen the location of hostile reserves and supporting weapons?

2. What obstacles and exposed stretches of terrain are there over which the enemy must pass, especially crests, edges of woods, village exits, and defiles?

3. What commanding ground may be occupied as hostile observation posts, and what areas within the defensive position would be exposed to hostile observation?

4. What terrain features are there in the foreground which, in friendly possession, would screen important defensive areas from hostile observation, favor long-range fire action, and constitute the best available positions for security detachments?

5. What areas are there where hostile forces might assemble for attack within the range of friendly supporting weapons?

6. What are the points within the position from which observation of the foreground can be most effectively carried out?

7. What are the locations from which approaches to the position can be most effectively swept by frontal and flanking fire?

8. What masks within the position can be used to conceal the location of reserves, and the approaches from the rear?

9. What areas are most menaced by the probable avenues of hostile approach and what are the fronts along which artificial obstacles to tank attack are most necessary?

10. What is the battalion keypoint?

A SOLUTION OF SECOND REQUIREMENT

1. The wooded areas to the front afford concealed approach. The woods are sufficiently dense to afford cover from long-range small-arms fire but not from artillery and mortar fire. They could be used to screen the location of reserves and weapons.

2. There are no natural obstacles in the area over which the hostile troops must pass. On the left the approaches for several hundred yards are exposed, while on the right only the immediate foreground is exposed. The edge of the woods east of CR 618-E and of the woods just in front of the right limiting point should be well covered by fire, particularly the latter for its nearness to the defensive position makes it a likely assembly area for hostile assault on the position.

3. There is no commanding ground in the foreground. However, since the southern slope of Hill *722-b* and the southeastern slopes of the ridge are generally concave, any defensive position on this slope not screened by trees can be observed from the open spaces in the foreground. The most likley points of hostile observation are along the northwestern edges of the woods north and east of T. Amos (42-41). Defensive positions to the west of CR 618-E are screened from hostile observation by the woods in the foreground.

4. The possession of the slight crest between RJ 567-G (42-41) and RJ 515-G (43-42) would distinctly limit hostile observation, and would afford excellent positions for long-range fire. That crest should be held by security detachments.

5. There are no defiladed areas where hostile troops might assemble for attack. However, the wooded draw southeast of G. Cary (43-42) and the woods east of T. Amos offer cover and concealment. Both artillery and mortar fires should be planned for these areas.

6. The crest of Hill *722-b* affords no observation of value. From the eastern edge of the woods on the northern portion of the hill excellent observation is available of the terrain to the east. Observation of the immediate foreground can be

gained only from the forward edge of the woods on the southeastern slopes of Hill *722-b*, and from the vicinity of P. Odle (41-42).

7. From positions anywhere in front of the woods in the left of the battalion defense area the wooded area in the central portion of the front can be covered. The approaches to the right of the area can be covered only from the forward edge of the woods in the vicinity of P. Odle.

8. Hill *722-b* forms an effective mask for covering reserves and the approaches from the rear. The wooded areas on the north slope of this hill also affords concealment from aerial observation.

9. The left half of the area favors hostile tank action. However, the fields of fire for antitank guns in this area are excellent and it can be readily covered. The right of the battalion area is most menaced by the approach of hostile foot troops. While difficult for tanks, this area is not impassable and is difficult to cover with antitank gun fire. It should, therefore, have first priority in obstacles.

10. The battalion keypoint is Hill *722-b*.

SITUATION CONTINUED

At 12:00 o'clock, Lieutenant Colonel 1st Battalion, having completed his personal reconnaissance, arrived at the edge of the woods where he is to issue the battalion defense order. Here he met the staff officers who had been sent on reconnaissance missions, and received the following reports:

1. *Lieutenant Reconnaissance Officer Company D*: "For long-range fire, guns located in the edge of the woods on the east slope of Hill *722-b* can fire on and beyond a line running from 100 yards forward of the left limiting point to the edge of the woods at point (42.5-42.0). From positions on the west slope of Hill *722-b* fire can be placed in front of the right of the area but not closer than C. M. Neff (42-41). From this location no fire can be placed east of the road running forward in the center of the area.

"The only defiladed area for mortars that also has concealment from aerial observation is in rear of Hill *722-b*.

Emplacements in the woods in the right front company area would be screened from the front. There is a small draw on the left of the battalion area near R. Floyd (41-44) where mortars could be emplaced. This area has no concealment from the air. In order to get observation of fire on the woods to the right front, the observer will have to be in the edge of the woods along the main line of resistance. From along the road in the vicinity of (41.9-42.7) the entire left front of the position can be observed. If the bulk of the fire of the mortars is to be placed on the right front, I recommend that all mortars be placed in the woods on the right side of the area.

"The battalion commander of the right battalion of the 3d Infantry, on our left, states that this battalion will be on the position in about two hours. He has instructed his heavy weapons company commander to arrange to have a section of light machine guns placed on the ridge to the east of O. Grisham (42-43) to fire generally in the direction of the limiting point on the main line of resistance. We can well place a section of machine guns in the valley about 400 yards south of O. Grisham to fire down the stream bed that passes through the limiting point. They will send an overlay showing fires that will support this battalion and ask that we do the same. Plum Creek forms little or no obstacle to tanks. It would require a prohibitive amount of work to convert it into a tank obstacle."

2. *Lieutenant Antitank Platoon Company D*: "The woods in, and in front of, our defense area form considerable obstacles to the movement of tanks, but they do not in themselves constitute tank barriers since tanks can maneuver through them. However, control would be difficult and progress slow. Middle Creek is little or no obstacle to tanks. The water is shallow and the creek bed firm, and in most places the banks are low. A tank attack against our position would probably come in the left of the area east of RJ 618-E (42-42), where they would have cover and some defilade, and where they can approach the position rapidly; however, some protection must be afforded the right company. I met

Lieutenant 1st Platoon Antitank Company a few minutes ago and he informed me he was placing one section of guns in the forward edge of the woods near here and one section on the northeastern edge of Hill *722-b*.

"I think the best location for the mines is in the clearing between the woods in the front of Company A.

"I recommend we place one section of guns in the edge of the woods west of P. Odle to cover the front of Company A and one section in the vicinity of O. Grisham (42-43) to cover the area to the left."

3. *Lieutenant S-1—S-2*: "We have no further enemy information. The trees on Hill *722-b* are too nearly uniform in height to get any observation from them. An observer at an OP located on the east slope of the hill can observe to the left front, but the center and right of the position cannot be seen from that point. In order to observe the center and right of the area, OP's will have to be established in the forward edge of the woods overlooking those areas.

"Lieutenant Communication Officer and I selected the Command Post in the vicinity of RJ 643-D (41-44) and he has started the installation."

4. *Lieutenant S-4*: "I recommend CR 595-E (40-43) for the ammunition distributing point. I also recommend it as the release point for the battalion section of the kitchen and baggage train. If the kitchens are to remain forward tonight, I recommend the woods near the ammunition distributing point or near RJ 643-D for the kitchen bivouac. The regimental ammunition distributing point is to be at RJ 59-D which is about one mile west of CR 595-E.

"The present load of all ammunition carrying vehicles is to be dumped on the position and one additional capacity load of all vehicles is to be placed on the position prior to darkness tonight. All vehicles are to be reloaded prior to returning to their bivouac."

5. *Battalion Surgeon*: "I recommend that the aid station be located in one of the three following locations in the following order of preference: (1) woods 250 yards north-

west of RJ 650 (41-43); (2) reverse slope of Hill *722-b* in the woods near the top of the hill; (3) woods 150 yards southeast of RJ 643-D."

THIRD REQUIREMENT

1. So much of the defense plan of Lieutenant Colonel 1st Battalion as pertains to the following:

a. Missions and general disposition of the heavy machine guns.

b. Missions and general disposition of the light machine guns.

c. General location of the .50 caliber machine guns and their principal direction of fire.

d. Location of antitank mine field.

e. Firing positions for the 81-mm mortars.

f. Boundary between forward rifle companies and the limiting point on the boundary between companies.

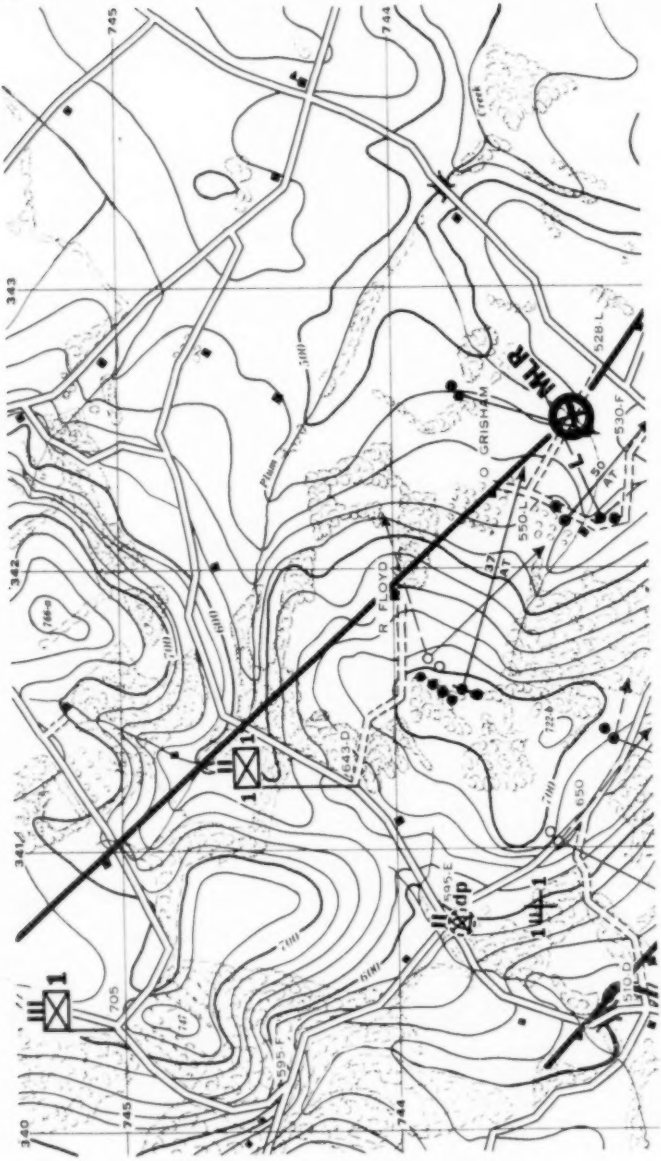
g. Location of the ammunition distributing point.

h. Location of the battalion aid station.

2. Having made his decision as to the distribution and location of the weapons of the heavy weapons company, what steps should Lieutenant Colonel 1st Battalion take to ensure that they will reach their postions without delay?

A SOLUTION OF THIRD REQUIREMENT

1. *a.* Emplace one platoon of heavy machine guns in close support of the main line of resistance, with one section in the vicinity of P. Odle (41-42) to cover the near edge of the woods to its right front, with its final protective line through the woods in the vicinity of RJ 618-E (42-42); the other section to be placed to the left (north) of RJ 618-E with sector of fire to include the edge of the woods southeast of RJ 618-E, and with its final protective line generally to the south. Locate the other platoon on the northeast slope of Hill *722-b* for long-range fire with supplementary positions on the flanks of Hill *722-b* for limiting local penetrations. (See Map C. The shaded portion of the final protective line has been omitted.)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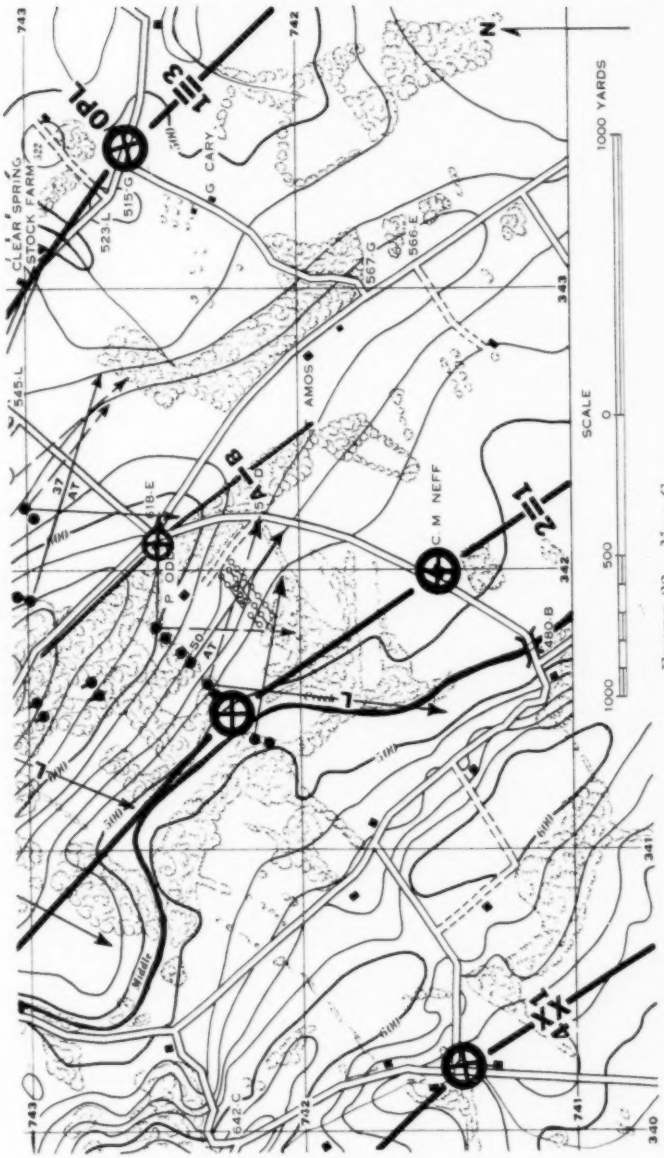


FIGURE 22.—Map C.

b. The light machine guns of the forward rifle companies to be emplaced on the flanks of the position to support the units to the right and left, and those of the reserve company, in conjunction with the heavy machine-gun platoon on Hill *722-b*, to assist in limiting penetrations. (See Map C.)

c. Locate one section of .50 caliber machine guns in the area of the left forward company in the orchard south of O. Grisham so as to cover the corridor entering the area from the left, and one section in the woods west of P. Odle to cover the right company. (See Map C.)

d. See Map C.

e. See Map C.

f. See Map C.

g. See Map C.

h. See Map C.

2. Lieutenant Colonel 1st Battalion should acquaint Captain Heavy Weapons Company with his decision as to the distribution of the heavy weapons and with such other parts of the defense plan as he needs to know at this time, and release him and the other officers of his company at once (prior to 12:15 PM) to enable these officers to meet their units enroute to, or upon arrival at, their designated assembly areas in order to move them into position without delay.

DISCUSSION OF THIRD REQUIREMENT

The formulation of a defense plan entails the coordination of a large number of separate decisions. Since the automatic weapons form the framework of the defense, among the earliest decisions of the battalion commander must be those relating to the general location and fire missions of his machine guns. The exact location of the gun positions will be selected by the platoon leaders assisted by the reconnaissance officer of the heavy weapons company.

In the defense, the fires of the light machine guns must be coordinated with those of the guns of the heavy weapons company. Therefore, the control of the position areas and missions of the light machine guns passes from the rifle company commanders to the battalion commander who in

turn will usually delegate to the company commander of the heavy weapons company the problem of coordination of the fires. These guns are normally employed within their own company defense areas in order to facilitate ammunition supply and control.

To facilitate control of the heavy machine guns by the platoon leader, the two sections of a heavy machine-gun platoon are emplaced in the center of the battalion defensive area and the light machine guns of the forward rifle companies are assigned position areas on the flanks.

The position areas of the .50 caliber machine guns are decided upon after an evaluation of the relative danger of tank attacks in various parts of the front, and in conjunction with the decision as to the location of any antitank mines. In the area west of the road, in front of the outpost position, there is relatively open terrain and little or no defilade or cover, while the defensive position and its immediate foreground is heavily wooded. These conditions are unfavorable for mechanized attack; however, some antitank protection must be provided. To the east of the road there is considerable cover and several defiladed assembly areas in front of the outpost, whereas the approaches to the position are open and permit rapid maneuver by mechanized vehicles. It appears that hostile tank attacks are more probable in the area of the left company. The platoon of the Antitank Company allotted to the 1st Battalion area is being emplaced to cover this part of the front. One section of the .50 caliber machine guns is emplaced in each company area. Whether or not these guns will be emplaced by sections or individually must be decided by the close examination of the terrain.

The 500 antitank mines available to the battalion are sufficient for a mine field approximately 335 yards in length. While the area in front of the left company is more favorable for tank attacks, there is no part of that front which can be blocked by a mine field of this length. In front of the right company, the mines may be used to block off the only favorable tank approach. The mine field is covered by both .50 caliber and .30 caliber machine guns.

One of the chief considerations in the selection of positions for 81-mm mortars is defilade. However, in the selection of any gun position the primary consideration is that the gun must be able to accomplish its assigned mission. Having determined that the primary target areas for the 81-mm mortars are to be in front of the defense area of Company A, the battalion commander has made the selection of a defiladed position an impossibility, there being no such position available. The position area selected does afford cover, access to a good motor route of supply, and is within the maximum limit of the available wire for connecting the observation post with the gun positions. In the preparation of these positions, emplacements must be dug to provide protection for the mortars.

Normally the defense of a tactical area, including the approaches thereto, should not be split between two organizations. This principle has been followed by the regimental commander in assigning boundaries between battalions. However, since the long ridge running southeast from Hill *722-b* comes near the center of the battalion area, its defense cannot be assigned to one company. Since the area of the right company is wooded, it should be assigned the narrower front. The road makes a suitable boundary. The limiting point as indicated on the boundary should be some point easily recognizable on the ground. CR roads 618-E fulfills this requirement.

The point recommended by S-4 for the battalion ammunition distributing point fulfills all the requirements for this installation. This recommendation was accepted by the battalion commander.

The battalion surgeon recommended three sites as suitable for the aid station in order of preference. Since the one given first preference by the surgeon is available, it is approved.

One of the principal means by which the battalion commander can facilitate the occupation of his defense area is to make early decisions relative to the location of his machine guns. Having made these decisions there is nothing

to be gained by holding the company commander of the heavy weapons company longer. It is probable that as the reconnaissance of the battalion area progressed the decisions relative to the emplacement of the machine guns were discussed and decided upon piecemeal. By the time the reconnaissance party arrives at the point where the battalion order is to be issued, the commander of the heavy weapons company has all of the information necessary for him to proceed with the disposition of his company on the ground. Prompt and efficient troop leading on the part of the company commander and platoon leaders should now result in the decision as to the exact location of all machine guns in the forward areas by the time the rifle company platoon leaders arrive in their areas. When this is the case the rifle company commanders and platoon leaders can intelligently employ their men with the minimum loss of time. Any effort to select positions for automatic rifles and riflemen prior to the location of machine guns will probably result in considerable lost motion.

SITUATION CONTINUED

Lieutenant Colonel 1st Battalion completed the major portion of his defense plan and prepared notes for the defense order. At 12:15 PM he issued the battalion defense order.

NOTE: In the selection of the locations for the artillery normal barrage and the primary target areas for the 81-mm mortars, consideration should be given to the characteristics of the weapons and the effect of the projectiles. The 81-mm mortar is a high angle fire weapon and the 105-mm howitzer can be emplaced to fire at high angles. The 105-mm howitzer can fire at medium ranges against reverse slopes up to 60 degrees and the 81-mm mortar against reverse slopes up to 75 degrees. When fired in trees so that the burst is above ground both weapons are effective up to the limit of their bursting radii. The 81-mm mortar, using the light shell, has a bursting radius of 15 yards. A burst 45 feet above the ground will have its full effect on the ground. The bursting radius of the 105-mm howitzer is

20 yards. Thus, it can fire with full effect into trees of a height of 60 feet. By using the delayed action fuze the shell will fall about 40 feet after impact before bursting; therefore, it can be used in trees up to 100 feet in height. A tabular comparison of the two weapons follows:

	Angle of fall. Can fire against reverse slopes up to	Bursting radius	Effective in woods. Can fire effectively in trees up to
105-mm howitzer	60 degrees	20 yards	100 feet
81-mm mortar	75 degrees	15 yards	45 feet

The artillery barrage is fired on a line and not on an area. This line can be placed at any angle with reference to the position. The normal barrage fired by the 105-mm howitzer battery extends 300 yards in length and is represented graphically by a rectangle 300 x 100 yards. Each battery is laid on its normal barrage line when not firing on other targets. A normal barrage can be fired without delay upon call from the unit to which allotted. The emergency barrage line is represented by a broken-line rectange 450 x 100 yards for a battery of 105-mm howitzers. The emergency barrage is fired by a battery other than in direct support, and in order to obtain this fire, the request must go through the artillery battalion fire direction center. This may require five or six minutes before the fire can be laid down.

The distance in front of the position that the barrage can be placed will vary from 200 to 500 yards depending upon several factors, primarily upon the distance in rear of the troops that the battery is emplaced. The artillery liaison officer should be consulted in all cases as to how close to the front line the barrage may be placed.

FOURTH REQUIREMENT

1. What officers should be present to receive the battalion defense order?

2. Show on Map C the following details:

a. The location and strength of all defense areas organized by the rifle companies. Indicate assembly areas for unit(s) held mobile for counterattack or for occupation of areas to limit hostile penetrations, if any.

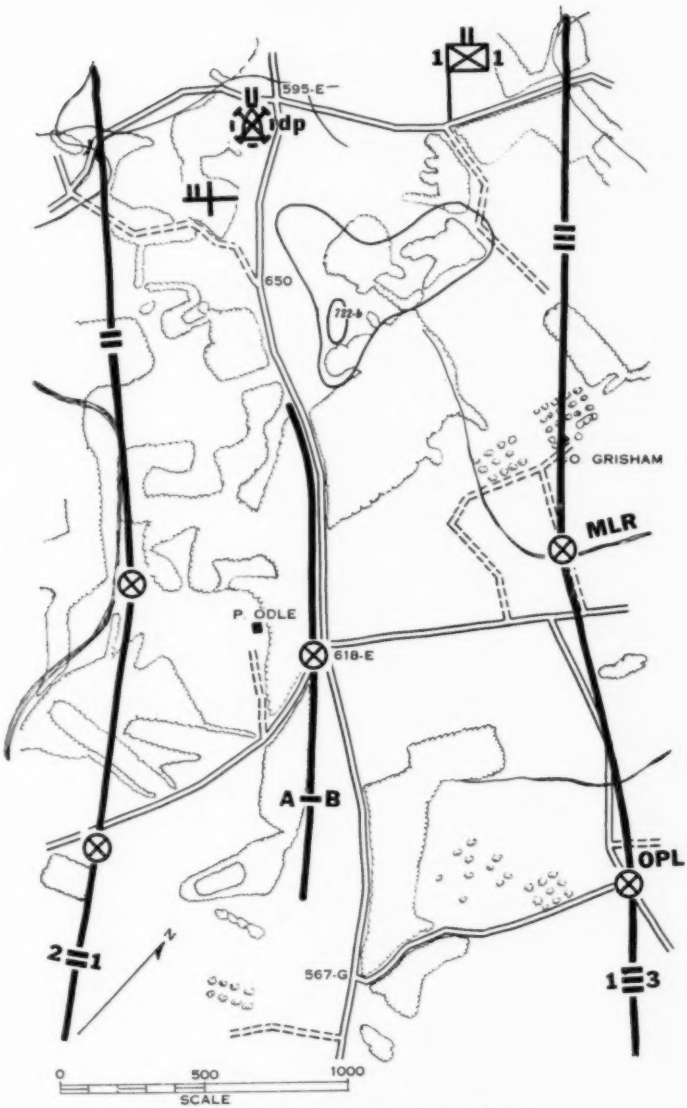
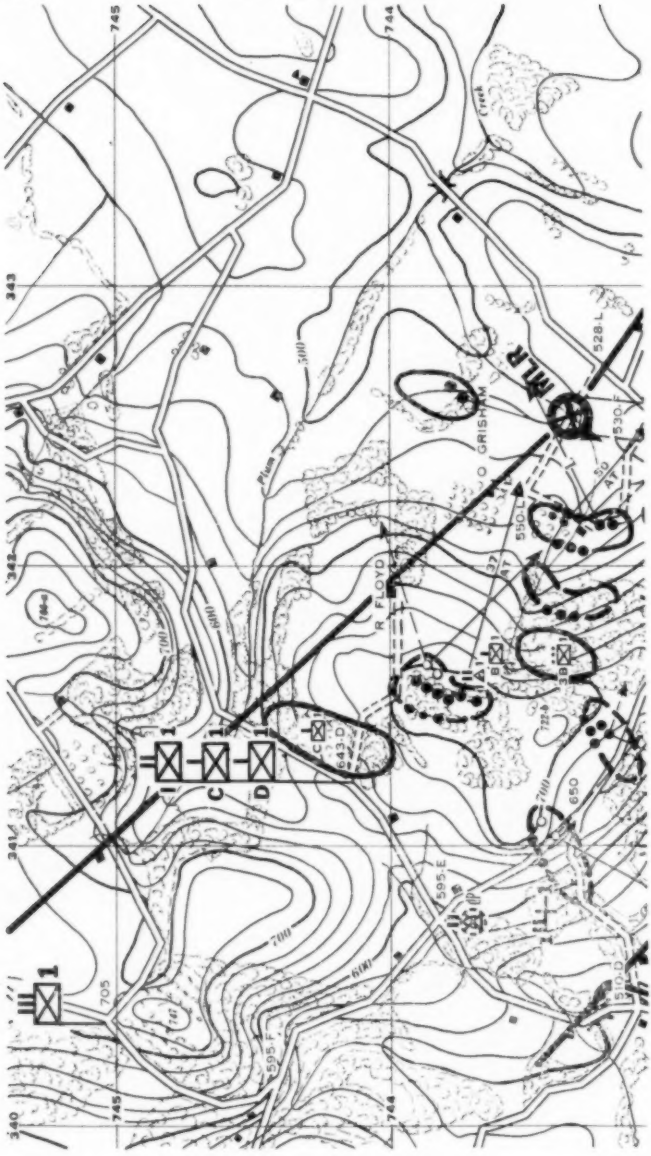


FIGURE 23.—Operations Sketch.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C 1
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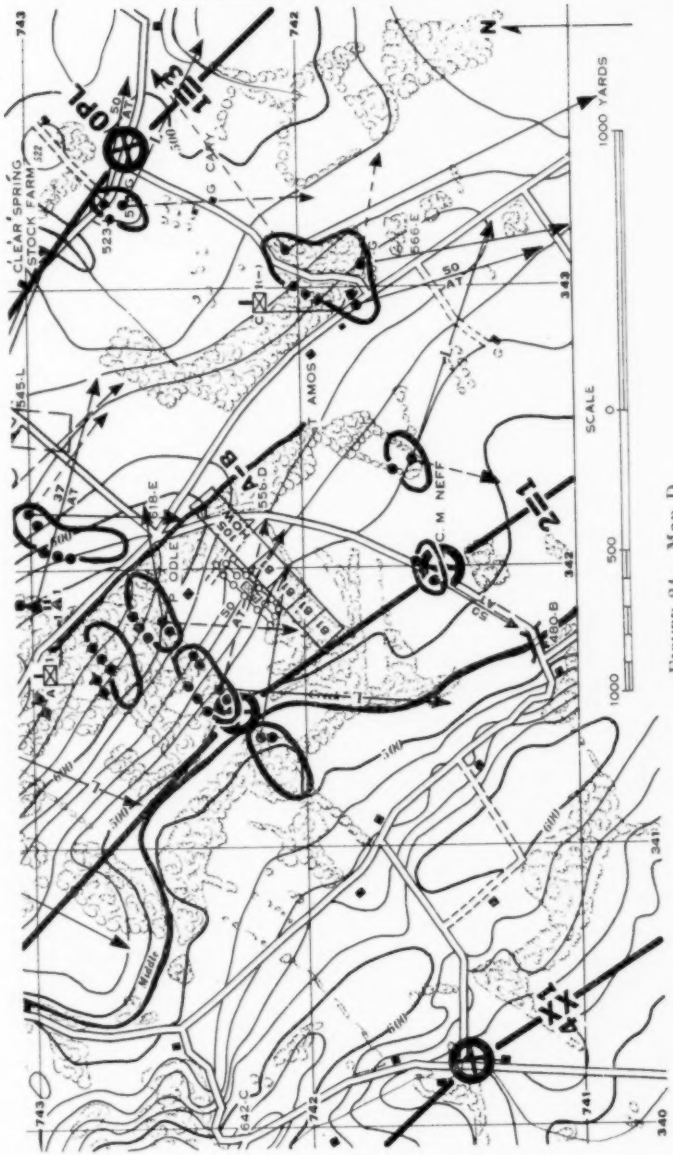


FIGURE 24.—Map D.

b. The locations of the company posts.

c. The location of the artillery normal barrage and the emergency barrage allotted to the 1st Battalion.

d. The locations of the 81-mm primary target areas.

e. The composition, location, and disposition of the combat outpost established by the 1st Battalion.

3. There being no maps available for use as operation maps, what expedient should Lieutenant Colonel 1st Battalion use to aid him in the issuance of his oral defense order?

A SOLUTION OF FOURTH REQUIREMENT

1. The following officers should be present to receive the battalion defense order:

Rifle Company Commanders
Battalion Executive—S-3
Lieutenant S-1—S-2
Battalion Surgeon
Battalion S-4
Artillery Liaison Officer

2. *a*, *b*, *c*, *d*, and *e*, see Map D.

3. He should have operation sketches prepared for the company commanders. See Figure.

DISCUSSION

In the selection of defensive areas for the rifle platoons, company commanders of forward companies are controlled largely by the requirement that the platoon defense areas must enclose the positions previously selected for machine guns. Wherever possible, mobility and flexibility are added to the defense by having platoons not required to garrison areas along the main line of resistance prepare one or more positions in rear from which they may either limit hostile penetrations, fire to protect the flanks of forward units, or both. These rear units may then be assembled and held mobile under cover.

The limiting point on the main line of resistance on the left boundary, while easily located, is in low ground. The

defense areas organized in this area are drawn back and the fires coordinated in the vicinity of the limiting point.

Since the area of Company A is generally wooded with good hostile assembly positions in the foreground, the normal barrage and the 81-mm primary target areas, are allocated to this part of the battalion area. The emergency barrage allotted the battalion is assigned to the area of Company B to assist in blocking an advance up the stream bed entering the battalion area from the 3d Infantry area.

Considering the width of the outpost and the numerous wooded areas in the front, two platoons are about the minimum that could effectively put up any coordinated resistance. The assignment of Company C (less one rifle platoon) to the outpost affords sufficient rifle strength, includes the company supporting weapons, and provides a headquarters with sufficient command personnel to control the outpost area.

In order to aid in deceiving the enemy as to the defensive positions and to increase the depth of machine-gun fires, one section of heavy machine guns is attached to the outpost. By careful planning and reconnaissance of the route for their withdrawal the weapon carriers can be kept near the guns to ensure their successful withdrawal and availability for later missions. In the usual situation a section of guns assigned breakthrough or long-range missions in the rear of the battalion area is utilized for attachment to the outpost. In this situation, since the position of the machine-gun platoon on Hill *722-b* affords such an excellent field of fire well in front of the main line of resistance, enabling it to support the withdrawal of the outpost, and since there is such a good covered route of withdrawal to their primary position, the section of machine guns near P. Odle might well be the one selected.

The battalion antitank weapons are initially placed on the outpost line to cover all roads leading into the position in order to stop hostile mechanized patrols prior to the attack. The carriers for these weapons should be placed under cover near their positions and arrangements made for their

withdrawal over concealed routes previously selected and reconnoitered. They should thus be able to reach their assigned areas in the defensive position.

Rifle units and automatic weapons are distributed in such a manner that the entire battalion front is covered by fire. This disposition will enable the outpost to stop all hostile daylight patrols in front of the outpost, delay and give warning of any attack in force, and deceive the enemy as to the real defensive position.

In order to obtain close artillery support of the outpost, the forward battery observers should run their wire lines forward and direct their supporting fires from the outpost position. Ordinarily there will be as many battery forward observation posts in a battalion area as there are normal artillery barrages allotted to the battalion. In the absence of instructions, these forward observers would normally move forward with the outposts of the battalion in the area which they are observing. In this situation the 1st Battalion 1st Infantry has been allotted one normal barrage and the 2d Battalion two normal barrages. Therefore, one observation group would be with the outpost of the 1st Battalion. If, for any reason, the regimental commander desired to place the artillery observation with the outpost in the reverse proportion, his request should go through the commander of the supporting artillery battalion. During the withdrawal of the outpost, the artillery observer, backtracking on his wire, and clipping in, can give the outpost close artillery support throughout the delaying action.

It will be most unusual for maps to be available for company commanders within the battalion. It is therefore necessary for battalion commanders to provide sketches. The staff sergeant topographical draftsman, who is chief of the battalion intelligence section, should be able to prepare these with facility. There being no sketching equipment provided for the battalion in the field, necessary equipment and supplies must be improvised. As a minimum the sergeant should carry a piece of heavy cardboard, some legal size first sheets, some overlay paper (typewriter second

sheets will serve the purpose), black, red and blue pencils, and carbon paper. Prior to starting on his reconnaissance Lieutenant Colonel 1st Battalion should hand his map to Staff Sergeant Topographical Draftsman and instruct him as follows, "Make a tracing of our battalion area showing boundaries, limiting points, streams, woods, roads and Hill *722-b*." The staff sergeant by working on his sketch at every opportunity when the command car is stopped during the reconnaissance can have it completed by the time they return to Hill *722-b*. The Battalion commander then indicates on the sketch the boundary between companies and other details of the battalion plan of defense as desired and directs the staff sergeant to make four additional copies. By means of carbon paper and tracing, these can be made rapidly and thus be available for issue to the company commanders and Lieutenant Antitank Platoon Co. D. See Figure 23 for an example of such a sketch.

SITUATION, CONTINUED

In his defense order Lieutenant Colonel 1st Battalion directed Captain Company C to prepare plans for counterattack as follows:

a. Plan I: In case of a penetration as shown on Map E.

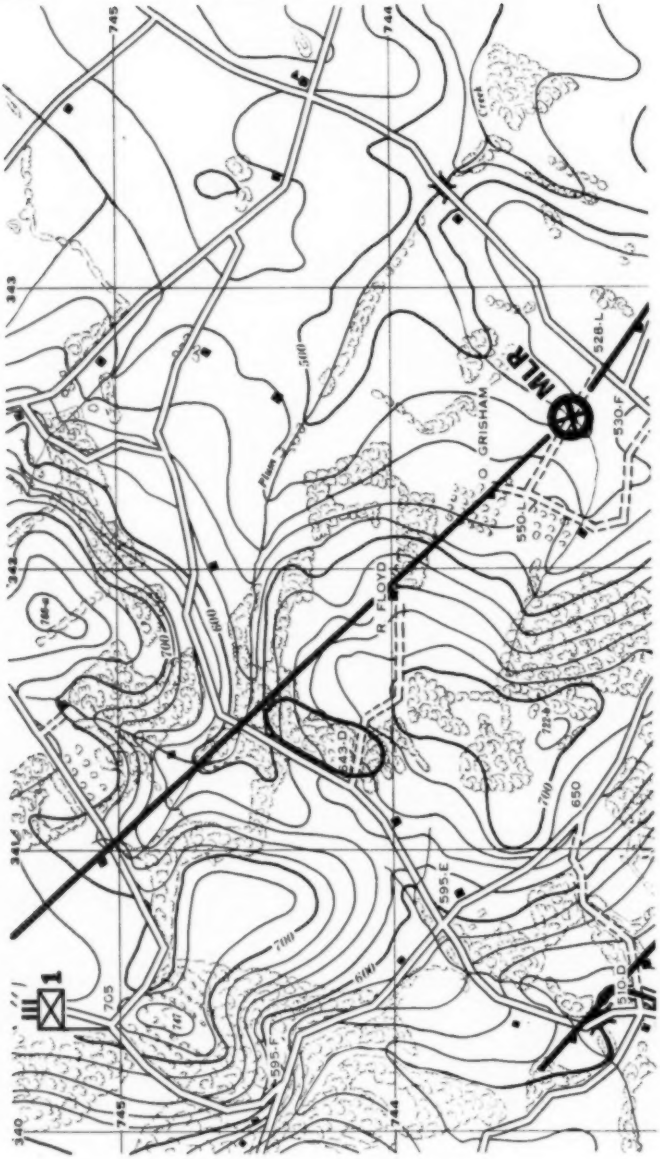
b. Plan II: * * * * * * * * * * *

FIFTH REQUIREMENT

On Situation Map E and the form "Plan for Counterattack" Figure 27, show graphically and/or by remarks the details of Plan I as submitted by Captain Company C.

SOLUTION TO FIFTH REQUIREMENT

For solution of fifth requirement, see Map F and Figure 28.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Creek

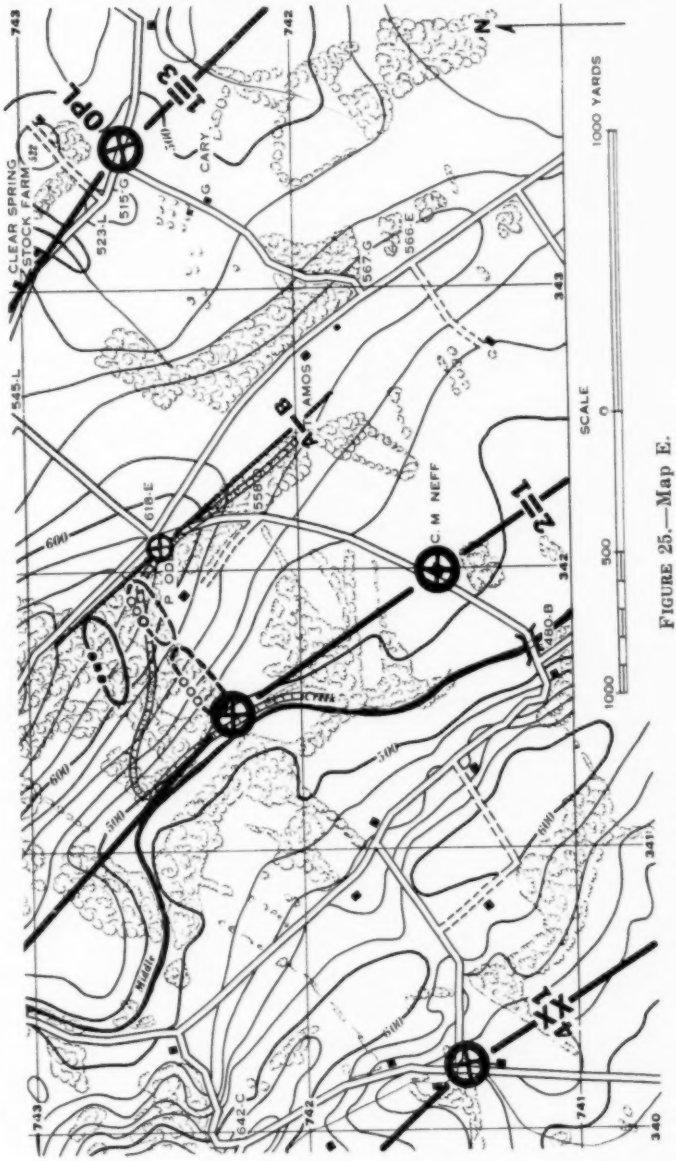


FIGURE 25.—Map E.

PLAN FOR COUNTERATTACK

Route: To L. D. .....

L. D. .....

Formation .....

Direction of Attack .....

Scheme of Maneuver .....

Objective .....

Machine Guns
- Initial Location .....
- Initial Fire .....
- Signal to Lift Fire .....
- Subsequent Use .....

81-mm Mortars
- Initial Fire .....
- Signal to Lift Fire .....
- Subsequent Fire .....

AT Weapons
- Initial Location .....
- Displace To .....

Artillery
- Initial Fire .....
- Signal to Life Fire .....
- Subsequent Fire .....

Weapons Platoon Co. C. .....
- Light Machine Guns .....
- 60-mm Mortars .....

Communications .....

C. P. .....

Remarks .....

FIGURE 27.—Form for Plan for Counterattack.

PLAN FOR COUNTERATTACK

Route: To L. D. *See Map F*
L. D. "
Formation "
Direction of Attack "
Scheme of Maneuver "
Objective "

Machine Guns
Initial Location "
Initial Fire "
Signal to Lift Fire: *Their own observation.*
Subsequent Use: *Protect right flank Co. C.*

81-mm Mortars
Initial Fire: *See Map F.*
Signal to Lift Fire: *Red chain parachute rocket.*
Subsequent Fire: *Primary target areas.*

AT Weapons
Initial Location: *Present location.*
Displace To: *None.*

Artillery
Initial Fire: *See Map F.*
Signal to Lift Fire: *Red chain parachute rocket.*
Subsequent Fire: *Normal barrage.*

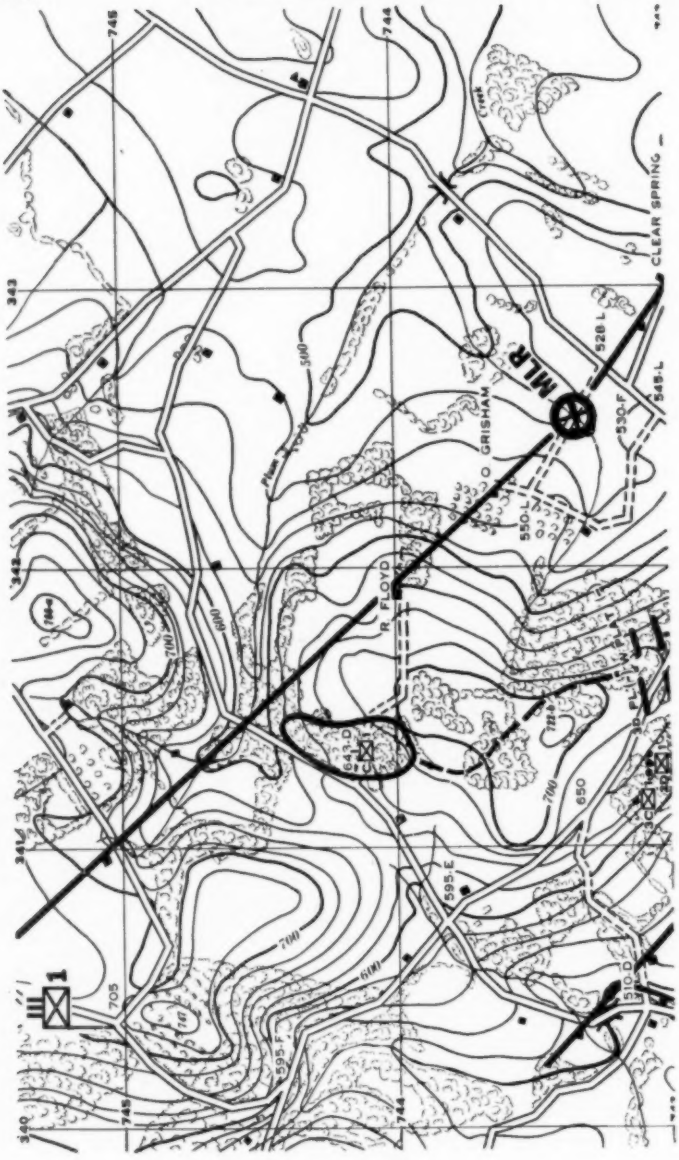
Weapons Platoon Co. C.: *Released to Co. C.*
Light Machine Guns: *Advance in rear of 1st Platoon.*
60-mm Mortars: (*Section less one squad*) *Support 1st Platoon. One squad attached to 2d Platoon.*

Communications: *With battalion SCR 195.*
C P *In rear of 1st Platoon.*

Remarks: *If additional artillery available thicken fires of (1) Btry A (2) 81-mm mortars. Company B protect left flank of Co. C. When available 3d Platoon Co. A attached to 3d Platoon Co. C.*

(NOTE: *Upon the reestablishment of the MLR, all elements of Co. A to be withdrawn to battalion reserve.*)

FIGURE 28.—Plan for Counterattack.


CLEAR SPRING
R FLOYD
GRISHAM
MLR
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545-L
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595-E
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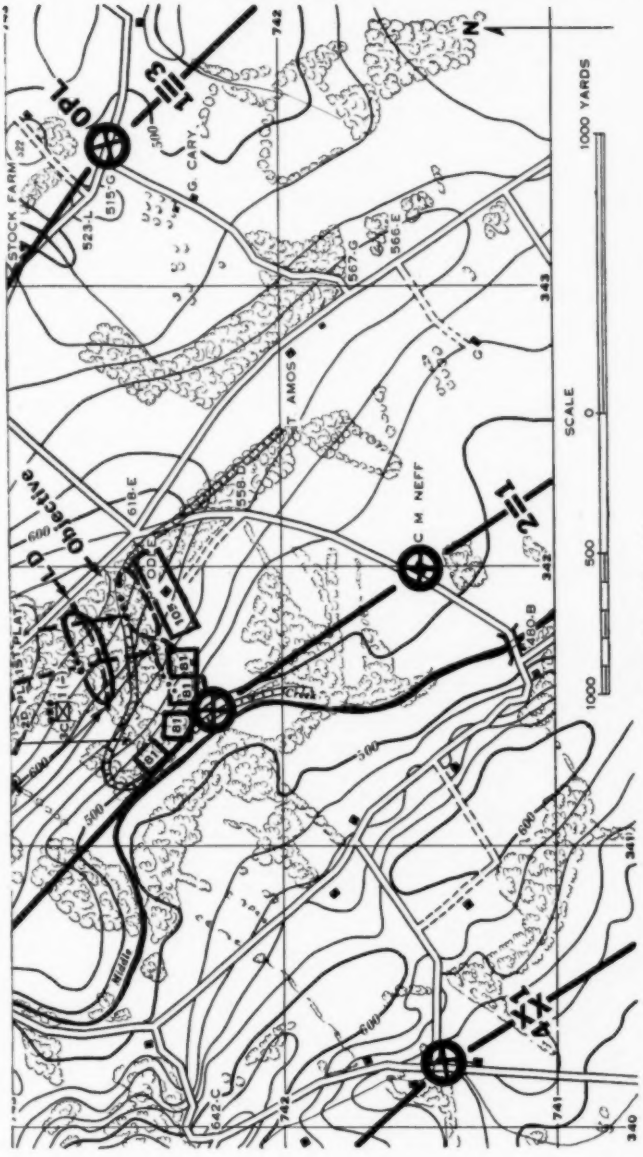


FIGURE 26.—Map F.

DISCUSSION

In any defensive situation the troop leading requirements of the commander of a reserve company of a forward battalion will require great activity on his part. In this situation where the company (less one rifle platoon) is detailed as the battalion outpost, this is particularly true. Manifestly Captain Company C must give first priority to the dispositions of the outpost. He probably would next assign missions to the platoon which is to remain in the battalion rear area. These missions would include selection and preparation of the locations for defense areas to be occupied by the various elements of the company to limit hostile penetrations. Concurrently with these latter activities the company commander must prepare the counterattack plans.

One of the primary requirements of any successful counterattack is that it must be coordinated and must be launched promptly. In order to do this, detailed plans are required. In particular, plans for supporting fires and the means for controlling these fires must be worked out in detail. In order to secure maximum coordination it is essential that each headquarters interested be furnished with copies of the various counterattack plans. Those interested would include the next higher headquarters, adjacent units, and commanders of supporting weapons. The preparation of counterattack plans, particularly the information required by other units, will be facilitated if some standard form, such as that shown in Figure 27, is used. Counterattack plans are normally either numbered or lettered for identification so that all concerned can be notified of the complete plan for any counterattack ordered by merely announcing that counterattack Plan "B", or whatever designation has been assigned, is to be launched at a time specified or upon the prescribed signal. After the completion of plans for counterattacks, depending upon the amount of time available, these plans should be rehearsed, or at least detailed reconnaissance for each counterattack made by all leaders concerned.

In the event of a penetration as indicated in the situation assumed for this counterattack, a satisfactory plan is difficult, because basically the counterattack will be an attack in woods. Among the problems presented in such a case we find that it is difficult to pick a line of departure. In this case the position organized by the 3d Platoon Company A is used. Supporting fires during the attack in this situation are impossible. Therefore, the available machine guns are utilized to protect the right flank of the counterattack. Also, since the guns providing this support are exposed, one squad of the reserve platoon is placed in position to furnish protection for these weapons. Upon reaching the line of departure for the attack the reserve platoon (less one squad) is directed to take position to protect the right flank of the counterattack. From the position assigned, it can also assist in preventing any further advance of the enemy in this area.

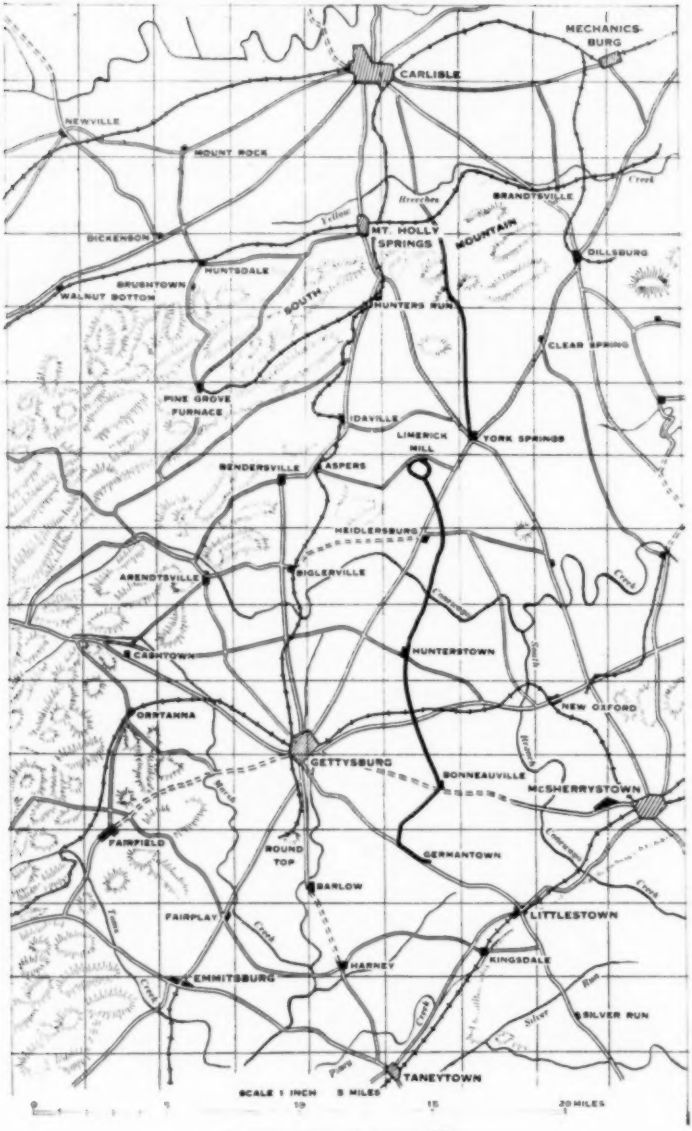


FIGURE 29.—General Map.

CHAPTER 5

Troop Movement by Motor

MAP PROBLEM

(AN INFANTRY SCHOOL TEACHING)

The purpose of this exercise is to illustrate some of the problems incident to the planning of a motor movement when the need exists for secrecy and passive protection against hostile aircraft, and to present certain methods of solving those problems.

SITUATION

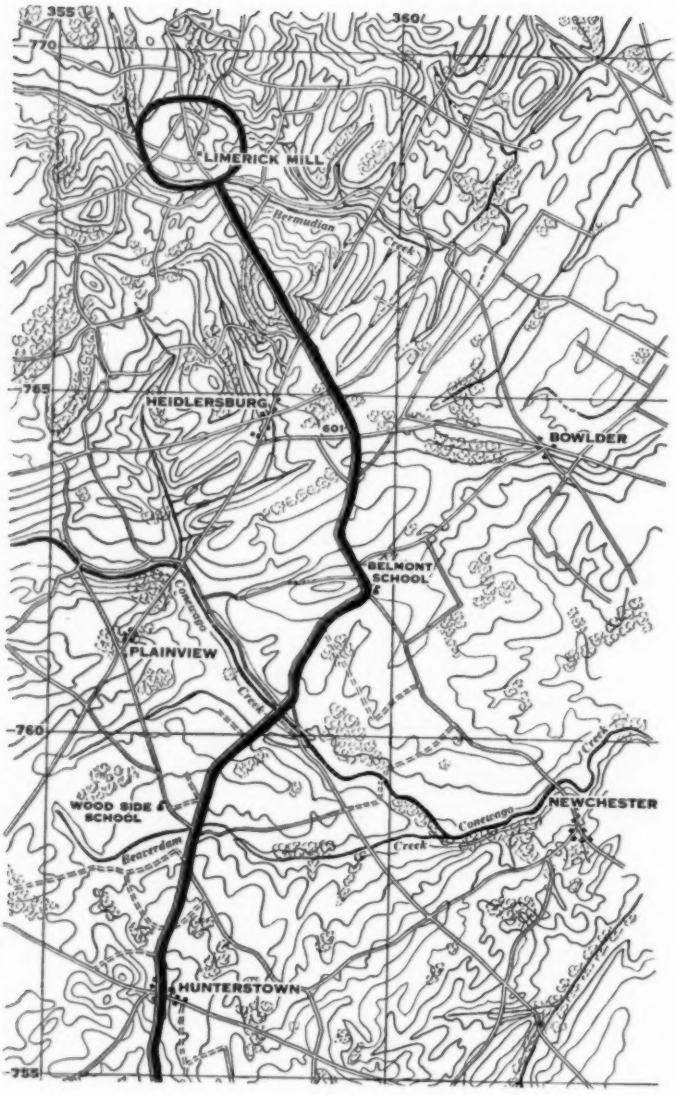
Blue (south) and Red (north) main forces are engaged in the area north of Carlisle (Figure 29—General Map). Observation and combat aviation are active on both sides.

The 1st Infantry, with other units of the 1st Division (Blue), is in bivouac on the Baltimore Pike in the vicinity of Germantown—Two Taverns, as indicated on the situation map. (Figure 30).

At 8:00 AM, 23 November, the commanding officer, 1st Infantry, returns from 1st Division headquarters, summons the members of his staff, and gives them in substance the following information:

"The 1st Division will move by motor today to the vicinity of Limerick Mill. The 1st Infantry will move via Two Taverns—Bonneauville—Granite Hill (village)—Hunterstown—Belmont School—CR 601 to the new area shown on situation map (Figure 30). This road is reserved for the exclusive use of the regiment for north bound traffic.

"One hundred and eighty 1½-ton trucks with attached medical officer and ambulance will be sent from Taneytown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HEIDLERSBURG
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BOWLDER
BELMONT
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PLAINVIEW
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WOOD SIDE
SCHOOL
Beaverdam
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NEWCHESTER
Conewago
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HUNTERSTOWN
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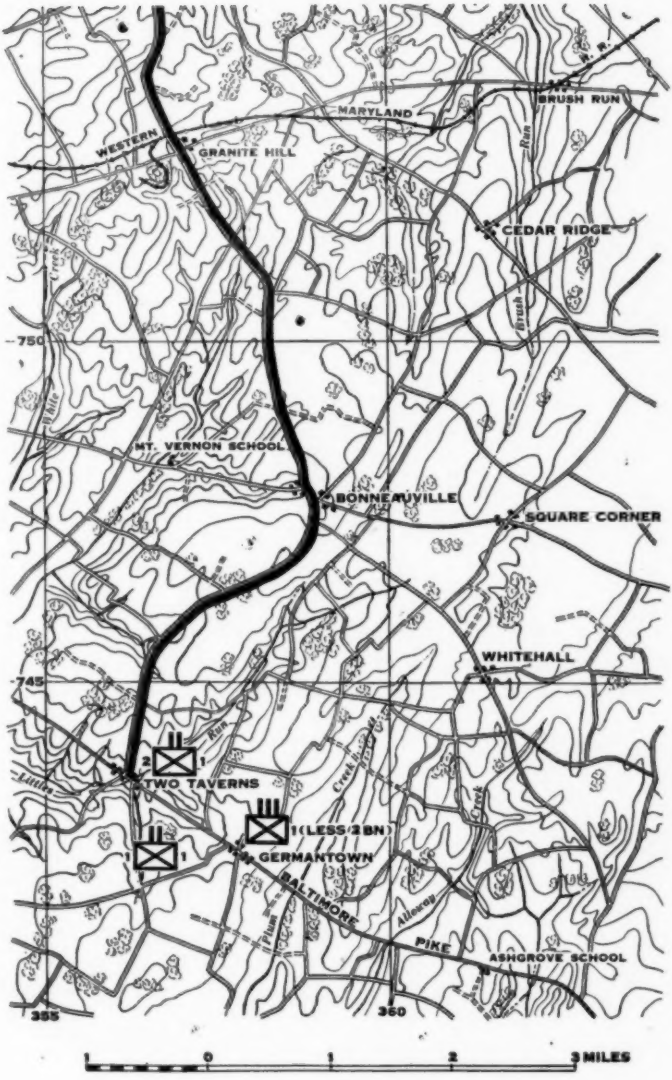


FIGURE 30.—Situation Map.

to transport the foot elements. They will pass to the control of the 1st Infantry at Ashgrove School (60-44), beginning at noon today at the rate of 80 trucks per hour.

"Army troops will secure the movement and the new area against hostile ground forces. The formation used for the march will be such as to insure maximum secrecy and passive protection against air attack. The movement must be completed by 4:30 PM.

"Organic vehicles (less those of one platoon Antitank Company, certain regimental command post vehicles, and four mobile maintenance crews of the Service Company) will move in advance of the trucks transporting foot elements. Battalion sections of the communication platoon and battalion trains (kitchen and baggage, ammunition, medical) will be attached to battalions and will accompany battalion organic transportation. Other trains will move as a unit. (Headquarters, Service, Antitank Companies and Medical Detachment).

"The movement will be by infiltration.

"S-3 will issue the necessary warning orders without delay.

"The staff will reassemble here at 8:45 AM prepared to make recommendations in detail".

* * * * * * * * *

You are S-3, 1st Infantry.

FIRST REQUIREMENT

Substance of the warning order that you prepare and units to which you have it distributed.

Your recommendations as to the following:

Traffic flow* of motor movement to be made, with brief reasons.

Order of movement of subordinate units of the regiment, subdivided where necessary.

---

* The number of vehicles that pass a given point within a given period of time (e.g., 500 vehicles per hour).

SOLUTION OF FIRST REQUIREMENT

The warning order issued by S-3 regarding the coming movement is, in substance, as follows:

"The regiment will move by motor today to the vicinity of Limerick Mill (55-65). Organic vehicles will be prepared at once to move on order. Foot troops will move in trucks about noon."

He distributes it to each battalion and to the commanders of Headquarters Company, Antitank Company, Service Company, and to the regimental surgeon.

S-3 makes the following recommendations regarding the matters specified:

That the movement be made with a traffic flow of about 80 vehicles per hour. This recommendation is based principally upon the fact that the vehicles must be dispatched at the rate at which they are received to avoid an accumulation in the area.

That the order of march of both the organic vehicles and the foot elements be: Detachment Headquarters and Headquarters Company; Antitank Company (less one platoon); 2d, 1st, and 3d Battalions, each with attachments; Headquarters and Headquarters Company (less detachments); Regimental Medical Detachment (less battalion sections); Service Company (less detachments); one platoon Antitank Company.

DISCUSSION OF FIRST REQUIREMENT

While a warning order is highly important, it does not necessarily include all known facts regarding the operation. Its prime object is to give subordinate commanders only that information necessary to permit them to make preliminary plans for the operation which is to come. In this case much of the information given to his staff by the regimental commander is omitted from the warning order. Some of it does not concern subordinate commanders; some will be given to them later, as it is not necessary at this time to their plans or preparations for the movement.

The commanding officer 1st Infantry might have ordered any one of three recognized types of march—close column, open column, or infiltration.

Close column is used when a large volume of traffic must be passed over short distances in a minimum period of time. It is also applicable to short, high-speed movements from cover to cover when a minimum time of exposure may reduce the chances of discovery and attack. Normally, however, close column is not justified except when the column is protected by an aerial escort or is otherwise secure from hostile air attack.

Open column is particularly applicable to tactical moves which must be made during daylight without aerial escort and when time is so important that lack of secrecy and reasonable losses from air attack are acceptable.

When sufficient time and road space are available, *infiltration* is used to provide the maximum of secrecy, deception, and dispersion as a means of passive protection against enemy air observation and attack.

Close column is the most rapid, but offers the best target to air attack and is least desirable from the viewpoint of preserving secrecy as to the nature of the movement. Open column offers a fairly poor air target. On the other hand, infiltration, being designed to present a picture of approximately normal traffic, affords a very poor air target, tends to the greatest possible secrecy as to the nature of the movement, and offers a possibility that the movement itself may not be detected. Since secrecy and reduction of vulnerability to attack from the air are particularly enjoined by the division commander in this situation, infiltration is the proper selection.

To carry out this movement, S-3 must provide answers to certain questions. First he notes the total number of vehicles involved in the trip, as follows:

	Organic Vehicles.	Non-organic Vehicles for Foot elements.
2d Battalion with attachments	46	55
1st Battalion with attachments	46	55
3d Battalion with attachments	46	55
Regiment, less above	64	15 (includes 4 spares).
Total for movement	202	180
Grand total, organic and non-organic		382

In the above computations, S-3 ignores trailers, which in a movement by infiltration, make an inconsiderable difference in time length.

He also disregards ¼-ton liaison trucks, as these probably will be used largely in control of the various entrucking groups and require no additional road space; and he ignores any small number of vehicles which may be sent forward with reconnaissance and quartering parties.

S-3 also solves the simple arithmetical problem necessary to ascertain the approximate time of arrival at Ashgrove School of the last of the 180 non-organic vehicles. Since they are to start arriving at noon and are to arrive at the rate of 80 per hour, he decides that the last vehicle will pass to control of the regiment at Ashgrove School at about 2:15 PM—80 by 1:00 PM, 160 by 2:00 PM, and the remaining 20 in the next quarter of an hour.

He studies the situation map (Figure 30) and sees that in this move all trucks will pass through Two Taverns. The trucks allotted to the 1st Battalion will have to travel the greatest distance in going from Ashgrove School to Two Taverns. This distance is about four miles or (at 25 miles per hour) a time distance of about 10 minutes (9.6). He allows for a 15-minute delay by each vehicle at the entrucking points. (Driver checks vehicle and receives detailed instructions—Troops load). He measures on the map the distance from Two Taverns to Limerick Mill and finds it to be 16.5 miles, or (at a road speed of 25 miles per hour) a time dis-

tance of about 40 minutes (39.6). The vehicles travelling the greatest distance, therefore, will require about one hour and five minutes (9.6 + 39.6 + 15.0) from the time of arrival at Ashgrove School, to complete the trip to the new area. Since the last vehicle will be received at Ashgrove School at 2:15 PM, it should arrive at Limerick Mill at about 3:20 PM—an hour and 10 minutes earlier than it is required to be there. S-3 would like to use this extra time to effect a greater dispersion on the road, but is confronted with the fact that the vehicles arrive at the rate of 80 per hour, and, if they are dispatched at a lesser rate, there is sure to be an accumulation of vehicles which will tend to violate the orders from the division commander requiring maximum secrecy and passive protection against air attack. In the absence of any convenient area for concealment of the vehicles, he therefore decides upon immediate dispatch of each vehicle to avoid this accumulation.

Tactical considerations enroute (except for secrecy and exposure to air attack) are reduced to a minimum in this situation, since the regimental commander has been informed that the Army will secure the movement against ground attack. The order of movement of the units, therefore, becomes largely one of convenience and comfort of the troops. The following reasons determined the order of movement given in the solution:

The forward echelon of the regimental command post should proceed to the new location in advance of or with the first units, in order to establish the new regimental command post. It is probable that the regimental commander himself would wish to be in this party, as he will be desirous of learning, at the earliest practicable moment, the probable nature of the mission which has led to the operation. A detachment of the Headquarters and Headquar- Company, therefore, is the first unit to be sent.

After arrival in the new area, the regiment must provide local security even though Army troops are securing the area. The most probable immediate ground threat will be from hostile mechanized forces, so the Antitank Company

(less one platoon) is sent next, to reconnoiter and make tentative dispositions for defense against such a threat. One platoon of the company remains to protect the old area until all units have departed.

The order of movement of battalions is not important. They may be sent in any order made most convenient by their location and the road net. However, the one nearest to the new location is sent first to avoid sending the vehicles transporting other troops through its bivouac area and to reduce the probability of congestion and mixing units in any entrucking area. In order to reconnoiter their new areas and to keep abreast of the situation, battalion commanders will probably wish to move with their organic vehicles, leaving their battalion executive officers to supervise the movement of the non-organic vehicles assigned to their respective battalions. The company commanders of the heavy weapons companies, Headquarters Company, and Service Company should each leave an officer to accompany the foot elements.

The Regimental Headquarters and Headquarters Company (less detachments), the Medical Detachment (less detachments), the Service Company (less detachments), and the platoon of the Antitank Company come last. The same reasons govern the holding of a part of the Regimental Headquarters and Headquarters Company until the last that governed the sending of a portion of it first; that is, operating the regimental command post at Germantown until the new one is opened at Limerick Mill.

SITUATION, CONTINUED

At 8:45 AM, the staff is reassembled, and the regimental commander calls upon S-3 for his recommendations. S-3 gives his recommendations, which are approved. In addition to the recommendations called for in the requirement, S-3 recommends that the 1st and 2d Battalions, with attachments, be entrucked at their present locations, and that the remainder of the regiment be entrucked at a third entruck-

ing point. The regimental commander now directs S-3 to send forward immediately route reconnaissance, road marking, and quartering parties.

SECOND REQUIREMENT

The approximate strength of these parties, and the duties of each group composing them.

SOLUTION OF SECOND REQUIREMENT

The reconnaissance party should include an officer, in command, one or more noncommissioned officers, one or more messengers, and personnel to mark the route. The duties of the officer are:

To learn the general condition of the road.

To study the route for possible points of delay, and for suitable detours around such points.

To determine the condition of bridges, viaducts, and underpasses, if any.

To estimate labor, time, and materials required to correct any causes of possible delay found enroute.

To report back important findings, probably by telephone.

NOTE:—In this particular case, due to the brief duration of the march, no points for halt or re-supply enroute are likely to be necessary. Otherwise these would be included.

The road-marking party would be included in the reconnaissance party in this case and would drop off guides at points at which the column might lose direction. The map indicates that at least twelve men would be required. However, more might be necessary and should be provided, as the provision of an adequate number of guides is a vital necessity to the success of this type of movement.

Some of these men would also be dropped at points where the road crosses railways and main highways; for example, in the vicinity of Granite Hill and at CR 716 to signal the column of danger or control cross-traffic at such points.

The quartering party also might be under command of the officer commanding the reconnaissance party. Ordinarily, however, it will be headed by S-1. It includes a medical officer and at least one representative from each battalion and separate company—preferably an officer. Its duties are as follows:

The medical officer inspects the new bivouac area for general sanitary conditions and water supply and reports to the officer in charge.

The officer in charge then selects locations and facilities for the regimental activities and sub-allots the remainder of the available area to the battalions and separate companies.

The representatives of these subordinate units then study their allotted areas and are prepared to guide or direct their units to specific localities upon arrival.

DISCUSSION OF SECOND REQUIREMENT

Route reconnaissance is an indispensable part of the preparation for any movement. In this case, while not mentioned in the situation, the division probably has made an initial reconnaissance of all routes to be used by units of the division, but even that does not relieve the subordinate units of the necessity of sending personnel in advance for this purpose. There will, of course, be frequent occasions when it is impracticable to reconnoiter far in advance, because of lack of time or for other reasons. In such cases, a map reconnaissance should be made and some personnel should be sent in advance of the column even if they can precede it by only a few minutes. The road-marking party normally will be a part of the reconnaissance party. In this case, the unit is to move over a route with numerous sideroads which may offer possibilities for error in following it. The posting of personnel as guides, and guards at dangerous points enroute, necessitates the making of plans for picking up this personnel after they have accomplished their missions. One satisfactory solution is to start the party out with the first vehicle empty except for the driver and the officer in command of the party. This vehicle is left at the point

where the first man is stationed. When the column has passed, this first man follows with the vehicle, picking up other road marking personnel enroute. Other vehicles of the road marking party, as they are emptied, are left at various points in the same manner, and the same procedure is followed.

One of the most important duties of the reconnaissance personnel, of course, is to get important information back to the column in time to be of use. Where time permits, the officer in charge will return before the start of the actual march, to impart this information. In this case there is insufficient time. As organic vehicles must clear Two Taverns not later than 12:25 PM, the first organic vehicle must pass Two Taverns not later than 10:00 AM (202 vehicles less 8 vehicles of the antitank platoon and 2 vehicles for the regimental command post, or 192 vehicles at 80 vehicles per hour will require 2 hours and 24 minutes to pass a given point). Therefore reports must be made by telephone, telegraph, or swift messengers from points enroute.

Every effort is made to select areas for all units, in advance of their arrival, to avoid halting them at their destination while these decisions are made. This is desirable for two reasons. First, it prevents the bunching of transportation with the resultant threat to secrecy, and second, it is a morale factor, as troops are adversely affected by any unnecessary delays in the completion of a movement. Quartering parties should always precede their units, or, where this is impracticable, move with the advance elements.

SITUATION, CONTINUED

The regimental commander approved the recommendations made by S-3 and acted on recommendations made by other staff officers. The staff conference then was dismissed. S-3 proceeded to make plans for the execution of certain details not of sufficient moment for consideration at the staff conference.

THIRD REQUIREMENT

Your supplementary decisions as to the following matters:

(1) Methods to be used in receiving and distributing the incoming non-organic vehicles, according to the requirements of the various subordinate units.

(2) Methods to be used to ensure the greatest possible secrecy during entrucking.

(3) Methods to be used to ensure, enroute, the following:

(a) Preservation of the desired formation.

(b) Maintenance of integrity of units.

(c) Availability of any required maintenance vehicles and personnel.

(d) Availability of additional transportation for loads of any vehicles which may become disabled.

SOLUTION OF THIRD REQUIREMENT

(1) Personnel with markers will be placed at all road junctions leading to the locations of the various units. The first truck arriving at the point at which trucks pass to control of the 1st Infantry will be stopped, and an officer, detailed from the first entrucking group for the purpose, will guide it to the entrucking point of that group, notifying all personnel with markers to direct succeeding trucks in the same direction until another officer gives him instructions to the contrary. An officer remaining at the point of reception of the vehicles will count the trucks that pass until the proper number for the first entrucking group have been dispatched. He will then stop the next truck and place upon it an officer from the second entrucking group, who will guide it to the proper entrucking point and notify all personnel with markers as he passes to direct succeeding trucks in the same direction until the orders are changed. Similar methods will be employed until all trucks have been properly disposed of.

(2) To insure secrecy, entrucking groups will be instructed in advance as to the approximate time trucks for the

transportation of their foot elements will start arriving and will be directed to load and dispatch them as rapidly as possible. In entrucking areas which offer suitable concealed locations, trucks will be loaded in such concealment.

(3) (a) In order to preserve the desired formation enroute, each entrucking group commander will be directed to inform each driver of the prescribed road speed and the maximum speed. He will also be instructed to dispatch vehicles at irregular intervals; that is a given number in a given time; for example, not more than seven vehicles each five minutes.

(b) To maintain the integrity of units enroute, each unit will be allotted all of its required additional trucks without a break. For the dispatch of the organic vehicles, each unit will be assigned a time for starting its dispatching and a time by which the last vehicle must clear a given point; for example, the crossroads at Two Taverns.

(c) To insure the presence of required maintenance personnel and activities, S-4 recommends, and S-3 adopts the recommendation, that the organic vehicles be followed by the shop crew of the maintenance section in its vehicles, and that the vehicles carrying foot troops of each entrucking group be followed by one of the four mobile maintenance crews.

(d) To insure the availability of additional trucks to replace any which may become disabled enroute, the surplus trucks of the 180 which come under regimental control for the movement will follow the last unit.

DISCUSSION OF THIRD REQUIREMENT

Were the trucks moving in close or extended column, a satisfactory solution of the problem of receiving and distributing them to the units would be to have an officer receive them and place a guide on the first truck for each entrucking point, the remaining trucks for that point following. In this case, however, the trucks are moving in by infiltration, and a number may arrive after the truck ahead has passed out of sight. The solution adopted provides for a series of men with markers to direct the trucks to their

destinations. Officers are stationed at the reception point or regulating point to count the trucks as they arrive and insure that the proper number are directed to each entrucking point. Other officers, representing the various entrucking groups, also stationed at the same point, accompany the first truck destined for their respective groups to guide it and to notify the personnel with markers of the change in destination of the trucks, which becomes effective with the passage of that truck.

The trucks are being received in an infiltration formation —the same formation that it is desired to use in the troop movement. This means that, if they are loaded and dispatched as rapidly as possible after their arrival, there will be no bunching and accumulation of large numbers of trucks at any entrucking point. S-3 therefore adopts this system. He also instructs commanders of entrucking groups to supplement these measures by taking advantage of any concealment existing in the area.

In a movement by infiltration, each vehicle is a march unit in itself. Each driver is on his own. With the varying degrees of skill that will exist among them, and with the varying mechanical condition of the vehicles, if all were allowed to use their own judgment as to speed enroute, there undoubtedly would be a bunching of vehicles which would tend to defeat the purpose of this type of movement. To guard against this, S-3 decides to have all drivers given a prescribed road speed and a maximum speed. By means of these two checks it should be possible to insure that the movement maintains, throughout, the general appearance of normal traffic. He charges the commanders of the various entrucking groups with conveying this information to their drivers, as the entrucking points will be the only points at which the vehicles halt for sufficient time to give these instructions.

In order, as far as possible, to keep the personnel of the various units together enroute, S-3 arranges to send vehicles to the various subordinate units in the order in which they have been directed to move. Knowing the rate of arrival of

the vehicles and the time distance from the point of reception to the entrucking points, he will be able to give the necessary directions to insure the readiness of each entrucking group to load the vehicles and move them out promptly. Preservation of their integrity during the movement will facilitate occupation of their bivouac areas upon arrival at the new location. It is probable that a certain number of maintenance vehicles will accompany the incoming truck column, but S-3 requests S-4's recommendations as to steps which will supplement that service with the maintenance facilities of the regiment in the most efficient manner. In a movement of nearly 400 vehicles, such as this is, some vehicles will almost certainly have trouble. The maintenance section has one shop crew and four mobile maintenance crews. S-4's recommendation uses these to the best advantage in the circumstances; the shop crew follows the organic transportation, and the four mobile crews follow the entrucked foot troops of the four entrucking groups.

Under the conditions stated in the problem, 55 trucks will be required to move each of the battalions, 7 trucks to move the foot elements of the Headquarters Company and 4 to move the foot elements of the Service Company--a total of 176 trucks. The 180 trucks being sent to the regiment, therfore, are four more than the number required. These four trucks will be empty, initially, and will follow the last personnel carrying trucks of the last unit. In this way they will be able to pick up the loads of any of the trucks which may become disabled enroute and insure the arrival of all personnel without serious delay.

SUMMARY

Careful advance planning and preparation is highly essential to the success of any troop movement by motor.

Any troop movement must be preceded by as thorough a reconnaissance as is practicable, and the results of this reconnaissance must reach the column in time to be of benefit.

Infiltration is the only type of movement by motor which offers any probability of secrecy by day. It also presents the least vulnerable air target.

Control of movement by infiltration enroute is most easily effected by careful instruction of all individual drivers in advance as to rate of march and maximum speed.

Whenever there is a possibility of a vehicle leaving the prescribed route, a guide should be posted.

CHAPTER 6

The Heavy Weapons Company in Attack

(AN INFANTRY SCHOOL TEACHING)

ILLUSTRATIVE PROBLEM

SITUATION

This morning the 1st Infantry, an interior regiment of a larger force, crossed the Chattahoochee River and marched to the east, on the Dixie and First Division Roads. (Figure 31—General Map). During the morning the advance guard (1st Battalion 1st Infantry) encountered hostile covering forces on Ridge 1. (Figure 32—Aerial Photograph). It attacked, drove in the hostile covering forces, and by 9:00 AM had occupied Hill 13, Hill 12, Ridge 11, Hills 10, 9, and 8 and was in contact with a hastily organized hostile defensive position on Hills 14 and 15. The leading elements of the 8th Infantry on the left are abreast of the 1st Battalion 1st Infantry. Colonel 1st Infantry ordered the remainder of the 1st Infantry into assembly areas.

The 3d Battalion 1st Infantry is now assembling in its prescribed assembly area in the woods east of Hill 4. (Figure 33—Situation Map.)

FIRST REQUIREMENT

What dispositions are ordered by Captain Company M for the caliber .30 machine-gun platoons for the defense of the battalion assembly area against hostile low-flying airplanes?

What dispositions are ordered by Captain Company M for the antitank platoon for the defense of the assembly area against hostile mechanized forces?

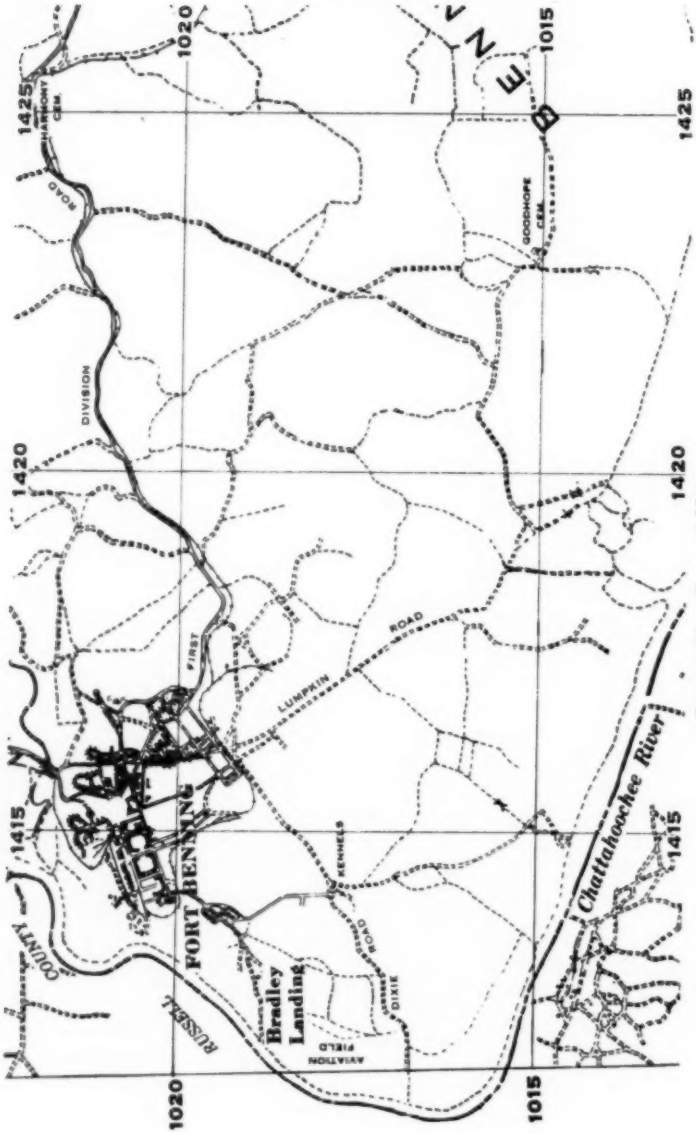


FIGURE 31.—General Map.

SOLUTION OF FIRST REQUIREMENT

The dispositions ordered by Captain Company M of the caliber .30 machine-gun platoons and the antitank platoon for the defense of the assembly area follow:

One section of caliber .30 machine guns on Ridge 3 immediately south of the Dixie Road; one section on the western nose of Hill 9; one section on western slope of Hill 4; and one section on Ridge 11 immediately south of the 1st Division Road, for the defense of the assembly area against hostile airplanes. (Figures 32 and 33).

The antitank platoon in the vicinity of RJ 410A for the protection of the assembly area against hostile mechanized forces from the directions of Hill 10, Hill 12, and Ridge 11. (Figure 32.)

DISCUSSION OF FIRST REQUIREMENT

The heavy weapons company is charged with the protection of the battalion assembly area against hostile air and mechanized forces. Protection against hostile aircraft is obtained by using all or part of the .30 caliber machine guns in suitable firing positions around the assembly area. The firing positions must be open, preferably on high ground, permitting a field of fire in all directions against hostile airplanes. As the effective range of .30 caliber machine guns against airplanes is approximately 1000 yards, the firing positions should not be farther than 1000 yards from the perimeter of the assembly area. Where possible, the best protection of a battalion assembly area against hostile air attack is concealment from hostile air observation. To plan for the protection of the assembly area against air attack, Captain Company M studied his map. He noticed that Hill 10, Hill 9, Hill 8, Hill 5, Hill 4, Ridge 3, and Ridge 11 surrounded the assembly area. (Figure 33.) He noticed also that Hills 8 and 5 were clear of woods for only narrow stretches, so narrow in fact that machine guns located therein would be unable to fire at airplanes until they were practically overhead. To obtain all-around protection, Captain Company M decided to distribute his machine guns by

DIXIE
ROAD

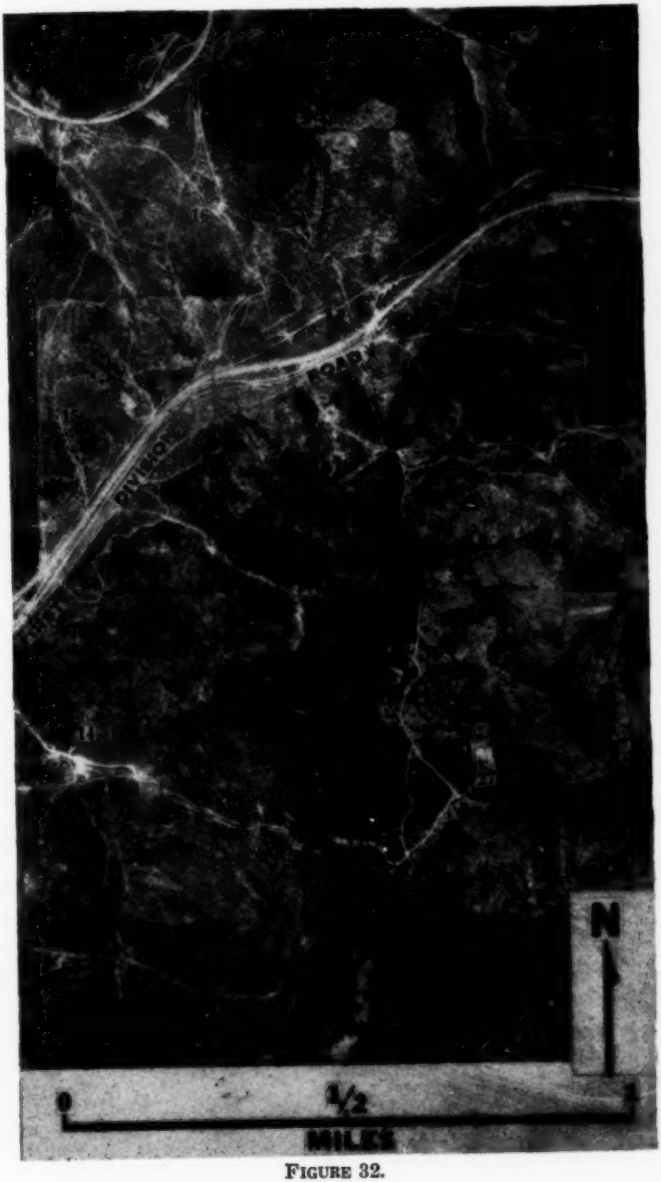


FIGURE 32.

sections as follows: One section on each of Hills 4 and 9, and one section on each of Ridges 11 and 3. Captain Company M ordered the initial dispositions of these guns as a result of his map study. Time was not available for reconnaissance prior to making the initial dispositions. Subsequent reconnaissance will verify the correctness of the position areas ordered for the defense of the battalion assembly area or show what adjustments must be made.

Captain Company M then studied his map to plan the protection of the area against hostile mechanized forces. He decided that the heavily wooded streamlines marked 80 and 81 on the aerial photograph (Figure 32) were a probable tank barrier, and that the terrain to the east and to the south appeared to be the most favorable ground for tank operations.

Captain Company M knows that the .50 caliber machine guns of the company are intended, primarily, to protect the battalion from the front and that the antitank guns of the regiment usually protect the flanks and rear. He knows, also, that the 8th Infantry to the north along the Marne Road is abreast of the 1st Infantry. With this knowledge of the situation and of the ground, he ordered the initial disposition of the antitank platoon. Subsequent reconnaissance may require some change in these dispositions.

SITUATION, CONTINUED

At 10:00 AM, the 3d Battalion is in its assembly area. An occasional artillery shell is falling along the First Division Road east of RJ 410A. Small arms fire is heard to the east. Observation and combat aviation, both friendly and hostile, have been reported by air guards.

At 10:30 AM, Lieutenant Colonel 3d Battalion received the regimental attack order and informed Captain Company M of the tentative plan of attack by the 3d Battalion as follows: (See Figure 33—Situation Map.)

"The 3d Battalion will attack at 12:35 PM from the vicinity of Hills 10 and 9 with two companies in the attacking

echelon, making the main effort on the left, to capture Ridge 16.

"The 1st Field Artillery Battalion, commencing at 12:20 PM, will place concentrations on the hostile positions on Hill 14, on the nose 400 yards northeast of Hill 10, and on Hill 15. At 12:35 PM all artillery fires will lift to Hill 15."

Lieutenant Colonel 3d Battalion, near the intersection of Ridge 11 and the First Division Road, directed Captain Company M to meet him at the stream junction 200 yards due south of Hill 9 by 11:10 AM, prepared to give his recommendations for the employment of the heavy weapons company.

Present on Ridge 11 with Captain Company M are Lieutenant Reconnaissance Officer, Sergeant Reconnaissance, and two messengers.

SECOND REQUIREMENT

The plan of reconnaissance of Captain Company M.

SOLUTION OF SECOND REQUIREMENT

Plan of reconnaissance. To have the sergeant reconnaissance reconnoiter the area north and northwest of Hill 9 for—

Caliber .30 machine-gun positions permitting fire on Hill 15 and on the nose 400 yards northeast of Hill 10.

Mortar observation posts and mortar positions in the same area, to accomplish the same mission.

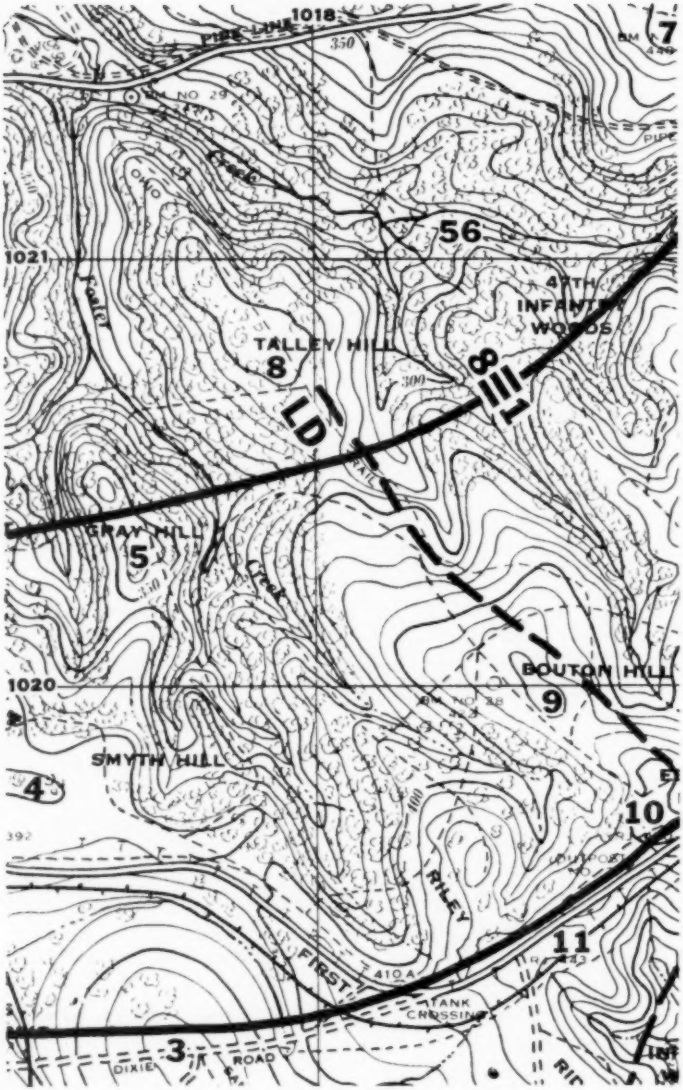
Possible tank approaches from the directions of Woods 56 and Hill 8.

To have the lieutenant reconnaissance officer reconnoiter Hill 10 and the south crest of Hill 9 for—

Caliber .30 machine-gun positions permitting fire on Hill 15 and on the nose 400 yards northeast of Hill 10.

Mortar observation posts and mortar positions in the same area, to accomplish the same mission.

Caliber .50 machine-gun positions to protect against hostile tanks from the directions of Hill 15 and Hill 14.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PIPE LINE
7
56
1021
47TH
INFANTRY
WOODS
TALLEY HILL
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GRAY HILL
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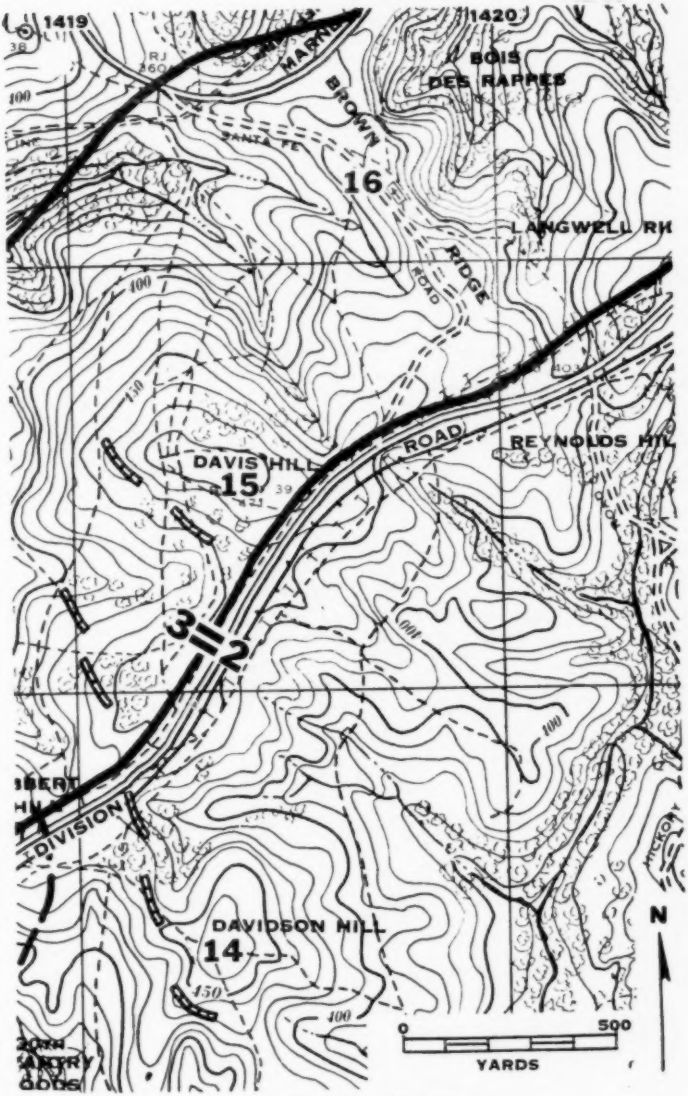


FIGURE 33.—Situation Map.

Personally to reconnoiter from the crest of Hill 10 to Hill 9 for the purpose of becoming acquainted with details of the ground in the battalion zone of action, and to contact Captain Company D to obtain full information of the enemy and to learn the exact locations of the guns of Company D.

To establish an observation post on Hill 10 with one messenger, in order to maintain constant observation of the hostile positions.

DISCUSSION OF SECOND REQUIREMENT

The heavy weapons company comprises the supporting and antitank weapons of the battalion. In the attack, the primary mission of the company is to render continuous close support and protection to the attacking echelon. The battalion commander is responsible for the basic decisions governing the tactical employment of this company. He may determine the possible supporting or protective fires and then plan his scheme of maneuver, or he may determine his scheme of maneuver and then direct Captain Company M to reconnoiter for position areas and targets to support the announced scheme. In either case the heavy weapons company commander is responsible for the reconnaissance to determine what supporting and protective fires are possible. In the company headquarters are two assistants, a reconnaissance officer and a reconnaissance sergeant, who aid the company commander in executing these reconnaissances. The battalion zone of action in this situation is about 1000 yards wide. There is insufficient time for one individual to reconnoiter this area for firing positions and targets suitable for all three types of weapons in the company. To plan a reconnaissance certain points must be considered. For what purpose and where should the reconnaissance be made? What officers, if any, should be contacted during this reconnaissance? Will observation posts be established?

In this situation Captain Company M studied his map and observed that Hills 10 and 9 offered the most favorable

position areas from which to place fire on the enemy to the northeast. Realizing that a detailed reconnaissance of this area could not be accomplished in time by any one individual, he divided the area as follows: Lieutenant Reconnaissance Officer to reconnoiter Hill 10 and the south slopes of Hill 9; Sergeant Reconnaissance to reconnoiter to the north and northwest of Hill 9. The instructions given to the lieutenant reconnaissance officer and sergeant reconnaissance were definite. Each was required to reconnoiter a particular area for position areas and targets for all weapons. It is undesirable to assign a reconnaissance mission pertaining to one type of weapon and covering the entire area. The area should be divided into parts and each part completely reconnoitered for position areas and targets for all weapons.

Reconnaissance prior to combat should be continuous through the use of observation posts. An enemy will not disclose his positions until forced to do so. Constant observation may determine slight movements that will establish the approximate location of hostile machine guns, observation posts, or groups of enemy.

THIRD REQUIREMENT

The recommendations of Captain Company M for the employment of the heavy weapons company in support of the battalion attack.

SOLUTION OF THIRD REQUIREMENT

Recommendations of Captain Company M.—To place one platoon of caliber .30 machine guns on Hill 10 to engage the hostile forces on the nose 400 yards northeast of Hill 10 with at least one section until masked; then to lift to hostile positions on the south and west slopes of Hill 15. Remaining guns to be sited on hostile positions on Hill 15.

To place one platoon of caliber .30 machine guns on Hill 9 to engage the hostile forces on the nose 400 yards northeast of Hill 10 with at least one section until masked; then

to lift to hostile positions on the west slope of Hill 15. Remaining guns to be sited to fire on hostile positions on Hill 15.

To place the mortars in the draw 200 yards south of Hill 9 with observation on Hills 10 and 9. The mortars to engage any located hostile automatic weapons and any entrenched riflemen.

To place the antitank platoon in position of readiness on Hill 10 to protect against hostile tanks from the directions of Hill 14, Hill 15, and Woods 56.

DISCUSSION OF THIRD REQUIREMENT

In this situation Captain Company M was directed to submit his recommendations for the employment of the heavy weapons company in support of an announced battalion plan of attack. When the company commander is directed to submit recommendations, he must be definite with reference to position areas and targets. He must give definite position areas for each type of weapon and the specific targets which should be engaged initially. Such recommendations as "the first platoon will support Company I" are considered inadequate. The commander must make up his mind what should be done and recommend it in no uncertain terms. In this situation Captain Company M believed that one-half of the .30 caliber machine guns should be so emplaced as to be able to fire on the hostile position 400 yards northeast of Hill 10 and, at the same time, be able to lift to Hill 15 without changing their position areas. His reconnaissance determined that this could be done. Captain Company M also believed that the hostile positions on Hill 15 must be covered initially with some guns. Also the north and south noses of Hills 9 and 10 provided the best position areas for the .30 caliber machine-gun platoons. The tops of these hills afford no protection for machine guns sited to engage the nose northeast of Hill 10 because of the dominant observation from Hill 15.

Mortar positions and observation are excellent in this situation. The observation posts established by each mor-

tar squad and properly controlled by each section leader and the platoon leader can and should cover most of the battalion zone of action. With such observation any located hostile machine guns can be immediately engaged.

The recommendation with reference to the caliber .50 machine-gun platoon follows closely the reasons given for the disposition of the guns in the discussion of the first requirement. The south flank is the most vulnerable because of the favorable tank approaches from the northeast, east, and south. Caliber .50 machine guns, properly distributed in defiladed positions of readiness (gun positions prepared and camouflaged) by sections on Hill 10, should be able to immediately engage a tank attack from any of the directions stated. The left flank of the battalion is protected by a heavily wooded draw and by the presence of the 8th Infantry.

SITUATION, CONTINUED

Situation at 1:15 PM.—The attack jumped off as scheduled.

Company L, the right leading company, after maneuvering its several elements, captured the ridge northeast of Hill 10 and is now pinned to the ground by small arms fire from Hill 15.

Company K, the left leading company, entered Woods 56 on the left of the battalion zone of action. It has not been seen or heard from since.

All elements of the heavy weapons company are now in their initial firing positions. The caliber .30 machine guns are firing on hostile positions on Hill 15. The mortars are not firing. Personnel in the observation positions are searching the area for appropriate targets.

FOURTH REQUIREMENT

Actions taken by Captain Company M at this time.

Give the probable general location at this time of—

Captain Company M

Lieutenant Reconnaissance Officer

Sergeant Reconnaissance
First Sergeant
Bugler
Lieutenant Mortar Platoon
Weapon Carriers
Transport Sergeant
Corporal Agents

SOLUTION OF FOURTH REQUIREMENT

Actions taken by Captain Company M at this time—none.

Probable location of—

Captain Company M	—On Hill 10 at Bn OP with Lieutenant Colonel 3d Battalion.
Lieutenant Reconnaissance Officer	—In vicinity of Hill 9 or following Company K reconnoitering for routes of approach and possible position areas to support Company K.
Sergeant Reconnaissance	—In vicinity of Hill 10 observing the attack of Company L and planning his route forward to reconnoiter for more advanced firing positions, from which to support Company L.
First Sergeant	—At company CP near the battalion CP.
Bugler	—With Captain Company M.
Lieutenant Mortar Platoon	—At one of the mortar observation posts on Hill 9 or Hill 10.

Weapon Carriers —Distributed in depth and in defilade under cover in the area Hill 10—Hill 9—Hill 4—Ridge 11, with one carrier per platoon, loaded with ammunition, as closely in rear of the platoon position area as the terrain and concealment permit.

Transport Sergeant —In the rear with the weapon carriers, or reconnoitering for covered routes of approach from Hill 4 to Hill 10 and Hill 9, or checking to make sure that each carrier has the best location for protection against hostile air or tank attack.

Corporal Agents —One, from a caliber .30 machine-gun platoon, with Captain Company L and one, from a caliber .30 machine-gun platoon, with Captain Company K. Others with their respective platoons.

DISCUSSION OF FOURTH REQUIREMENT

At this time, the fog of war is present with reference to Company K, the left attacking company. Elements of the heavy weapons company are lending all support possible under the circumstances. The various platoons are either firing at located targets or searching for targets. It is apparent, therefore, that Captain Company M at this time has no specific action to take.

The heavy weapons company commander is responsible for communications and liaison in the attack as follows:

With the battalion commander: This is accomplished by the company commander remaining with the battalion commander except, of course, when combat duties require his presence elsewhere. At such times the company commander will then have his representative remain with the battalion commander. The company observation post is established at the same place as the battalion observation post.

With the battalion command post: This is accomplished by establishing the company command post at or near the battalion command post. The first sergeant keeps at least one messenger present at the battalion message center.

With the attacking rifle companies: This is accomplished by detailing corporal agents from the platoons to report to and remain with each of the attacking rifle company commanders. Prior to combat the platoon corporal agents report to the company command post. They are then detailed by the company commander to their respective liaison missions.

With all platoons: This is accomplished by the exchange of messengers.

With the transport sergeant: This is accomplished through the first sergeant at the command post by means of messengers, foot or mounted.

During the attack, reconnaissance is constant for possible routes of advance, for more advanced firing position areas, for hostile targets, and for the location of friendly troops. This reconnaissance is conducted by the company commander with the assistance of his reconnaissance officer and reconnaissance sergeant. This reconnaissance follows behind the attacking rifle companies, keeping the rifle companies under observation.

The bugler and the orderly are usually with the company commander.

Platoon leaders of the various platoons during an attack will be directing and controlling their sections from suitable platoon observation posts. These may be identical with squad or section observation posts.

During the attack the control of weapon carriers and ammunition supply is usually a major responsibility of the company commander. When platoons go off carriers and move by hand to their initial firing positions, all weapon carriers and their personnel, that is chauffeurs and transport corporals, revert to company control, except, of course, when platoons are attached to rifle elements or are performing semi-independent or independent missions not under company control. The transport sergeant, as the company commander's assistant, handles these weapon carriers and the ammunition supply to platoons. When platoons go off carriers, the ammunition is reloaded on the fewest number of carriers possible per platoon. The empty carriers are immediately returned to the battalion ammunition distributing point for refill. The transport sergeant, through his respective transport corporals, moves one weapon carrier loaded with ammunition as closely in rear of each platoon position area as the situation and terrain will permit. The transport corporals contact their respective platoon leaders and notify them of the location of this advanced carrier. Each transport corporal inspects to see that his remaining weapon carriers are distributed along the route of advance (in defilade and concealed). When the leading weapon carrier is empty, the other weapon carriers move forward in the chain while the empty carrier returns to the battalion ammunition distributing point for refill. The driver of each weapon carrier should know the exact location of the weapon carrier next in front.

From the above discussion the probable locations of the personnel mentioned in the requirement are easily determined.

SITUATION, CONTINUED

The situation is now as shown in part on the Situation Sketch. (Figure 34.)

Companies L and K are pinned to the ground by fire from Hill 15.

The fire of the 2d platoon Company M, located on Hill 9, is masked by the attacking troops on Hills 15 and 7.

The 1st platoon on Hill 10 and the 4th platoon (mortar) south of Hill 9 are firing on targets on the crest of Hill 15.

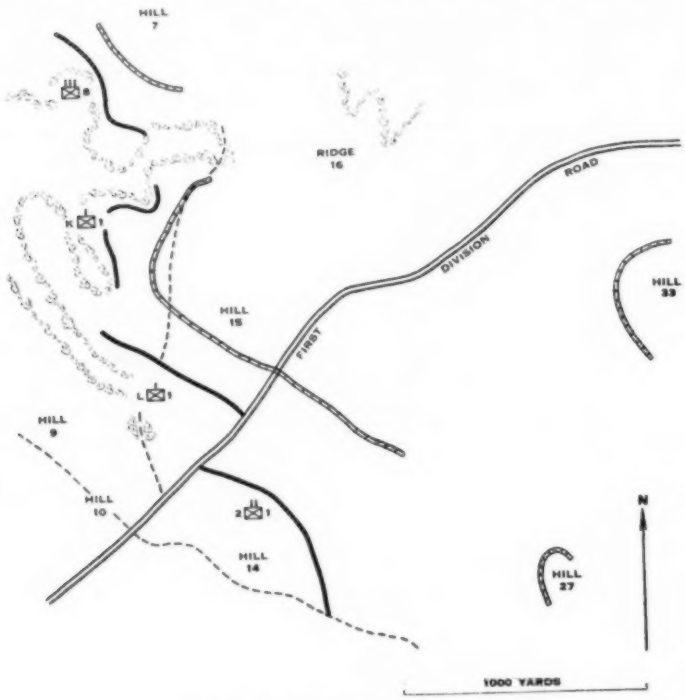


FIGURE 34.—Situation Sketch.

One section antitank platoon is in position on the nose 400 yards northeast of Hill 10; the other section is in position on Hill 10, both sections covering tank approaches from the south and east.

The 2d Battalion 1st Infantry on the right is pinned to the ground by hostile fires from the southeast nose of Hill 15, Hill 33, and Hill 27. (Figure 32.)

The 8th Infantry on the left is now fighting for Hill 7.

FIFTH REQUIREMENT

Orders, if any, issued at this time by Captain Company M with reference to the employment of the 2d platoon.

SOLUTION OF FIFTH REQUIREMENT

Orders issued by Captain Company M to Lieutenant 2d Platoon:

"Displace the 2d platoon, via the draw east of Hills 9 and 10 to positions just south of First Division Road on nose east of Hill 10 and engage the hostile positions on the southeast nose of Hill 15, south of First Division Road, and on Hills 33 and 27.

DISCUSSION OF FIFTH REQUIREMENT

In solving any tactical situation we should keep uppermost in our minds the mission. The mission of the heavy weapons company in the attack is continuous close support and protection of the attacking echelon. With the mission in mind then answer the question, "What is the situation?", and also the question, "With the means available, what can I do about it?" To render close support and protection of the attacking echelon demands forward displacement of weapons when the mission cannot be accomplished from present firing positions for reasons such as, their fires are masked; the distance from the attacking echelon is too great; or observation of essential terrain is lacking. Every effort must be made to keep all guns in action all of the time. In other words, if some guns are still performing proper missions and the fire of other guns is masked, then the latter guns should be displaced, if missions cannot be performed from their present position areas.

Except when platoons are attached to rifle units or are performing mission orders, the company commander orders forward displacement. The company commander, because of his constant contact with the battalion commander,

knows the situation and the desires of the battalion commander. He must, therefore, anticipate the need for forward displacement and plan and order these displacements in order to continue the mission of the company.

In this situation all guns of the company are being employed except those of the 2d platoon on Hill 9. There is more than one choice for the continual employment of these guns. They may be moved by way of a defiladed route, west of Hill 9 and Hill 10, to positions on Hill 10 to fire the same mission as the 1st platoon. The other choice and the one given in the solution is to move the platoon to the south flank which is now exposed because of the gap between the 2d and 3d Battalions. From the position area ordered, the right (south) flank can be protected and assistance given to the 2d Battalion on our right. In this case, assisting the advance of the 2d Battalion may be the best means possible of assisting our own attacking echelon.

CHAPTER 7

Motor Vehicle Maintenance in the Field and on the March

With each change in organization or tables of allowances, the number of motor vehicles in the infantry has been increased. All reports from Europe, China, and Africa indicate the important part such vehicles are playing in modern warfare. From day to day the prompt and efficient maintenance and repair of motor vehicles become more vital to the success of tactical operations.

Instruction in the maintenance of motor vehicles at The Infantry School is concerned primarily with first and second echelon maintenance; that is, drivers maintenance and that performed by maintenance personnel within the regiment, with equipment provided by current Tables of Basic Allowances.

Personnel, equipment, and supplies for second echelon maintenance in the infantry regiment, rifle, are provided mainly in the maintenance section of the transportation platoon of the service company. Under the present Tables of Organization (October 1, 1940) this section consists of one officer and 24 enlisted men as follows: 1 1st lieutenant, regimental maintenance officer; 1 staff sergeant, mechanic; 1 private, specialist 4 cl, clerk; 1 private, specialist 3 cl, welder; 5 privates, specialist 2 cl, mechanics; 5 privates, specialist 3 cl, mechanics; 4 privates, specialist 4 cl, mechanics; 2 privates, specialist 5 cl, chauffeurs; 3 privates, specialist 6 cl, chauffeurs; and 2 privates, basic.

The section has four trucks, 1½-ton, 4x4 cargo, maintenance, each with a front-mounted power-operated winch; four trucks ½-ton 4x4, similarly equipped with winches;

one truck, 4-ton, 6x6, wrecker, with winch and hoist; and one truck, ¼-ton, 4x4. It is provided with tools, equipment, parts, and supplies to perform first and second echelon maintenance.

The staff sergeant mechanic is chief assistant to the maintenance officer and acts as chief mechanic.

The clerk performs all the necessary paper work within the section.

The welder is in charge of the welding equipment, and is trained and equipped to make many emergency repairs.

The 14 mechanics are organized into a shop group of six mechanics and four mobile crews of two mechanics each.

The five chauffeurs drive the five 1½-ton trucks. There are no chauffeurs provided for the four ½-ton trucks, these being operated by the mechanics assigned to these vehicles.

The two privates, basic, are understudies, and are used for general duties.

In addition to the maintenance section in the service company, certain of the companies in the regiment are provided with personnel for assisting in the control, inspection, and second echelon maintenance of motor vehicles organically assigned to those companies. They are as follows:

Each heavy weapons company:
1 sergeant, transport
4 corporals, transport (1 in each platoon).
1 private, specialist 3 cl, motor mechanic.

Each rifle company:
1 corporal, transport (weapons platoon)

Antitank company:
1 corporal, transport.
1 private, specialist 3 cl, motor mechanic.
1 private, specialist 4 cl, motor mechanic.

Headquarters company:
1 sergeant, transport.
1 private, specialist 3 cl, motor mechanic.
1 private, specialist 4 cl, motor mechanic.

Tools and equipment for second echelon maintenance are provided as sets. Each motor mechanic is provided a motor vehicle mechanics set of hand tools of about fifty items which he carries with him wherever he may be riding. (See Figure 39.)

Unit equipment, second echelon sets, numbers 1, 2, 3, 4, 5, 6, 9, and set, welders, as listed in Circular No. 4 OQMG, November 1, 1938 are shown in Figures 40 to 48 inclusive.

The shop group and each of the mobile crews, carry a supply of parts as well as a small emergency supply of gasoline and oil. It is difficult to prescribe a general list of parts to be carried for all types of vehicles on different missions. In the absence of any standard list, such parts should be carried as experience dictates, for the particular transportation used, and the mission at hand.

In order that we may see how motor vehicles should be maintained in the field and observe the operation of first and second echelon maintenance on the march and in bivouac, let us accompany an instructor from the automotive section of The Infantry School who has been detailed as an observer at one of the army maneuvers. He has been provided with transportation and credentials which permit him to move about the area at will.

(NOTE: The opinions expressed by the instructor in the narrative which follows are not intended to represent the views of The Infantry School. They are presented for the purpose of calling attention to some of the difficulties encountered by units in the field and of suggesting one possible solution. Likewise, the methods of operation of the personnel are merely one solution of the problems presented.)

We join an infantry regiment of a triangular division in army reserve and learn that it has received orders to move early tomorrow, to a concealed bivouac in an area about 15 miles away. It is now about 3:30 in the afternoon. The regiment is completing its arrangements for the move. We join the maintenance section and find that the maintenance officer has just completed his instructions for the employ-

ment of the section on the march. Equipment has been loaded on the transportation, men have been assigned to vehicles and each group has been formed as prescribed for the march the following morning. The maintenance officer is just starting to inspect his section and, with his permission, we join him. This is what we find:

SHOP GROUP (Trucks in order of march.)

Vehicle	*Personnel*	*Equipment*
¼-ton	1 Lt (maintenance officer)	1 Set Pioneer Equipment Motor Vehicle
1½-ton	1 Pvt (record clerk)	1 Unit Equipment Set #4 (Block and Tackle)
	1 Pvt (mechanic)	1 Unit Equipment Set #1 (Mechanic hand tools)
	1 Pvt (chauffeur)	1 Unit Equipment Set #6 (electric generator)
		1 Motor Vehicle Mechanic Set
		2d Echelon Parts & Supplies
		1 Set Pioneer Equipment Motor Vehicle
1½-ton	1 Pvt (mechanic)	1 Unit Equipment Set #3 (air compressor)
	1 Pvt (chauffeur)	1 Unit Equipment Set #4 (block and tackle)
	1 Pvt (basic)	1 Motor Vehicle Mechanic Set
		1 Set Pioneer Equipment Motor Vehicle
1½-ton	2 Pvts (mechanic)	1 Unit Equipment Set #2 (mechanic hand tools,
	1 Pvt (chauffeur)	Supplementary Set #1)
	1 Pvt (basic)	1 Unit Equipment Set #4 (block and tackle)
		2 Motor Vehicle Mechanic Sets
		2d Ech Parts & Supplies
		1 Set Pioneer Equipment Motor Vehicle
1½-ton	1 Stf Sgt (mechanic)	1 Unit Equipment Set #4 (block and tackle)
	1 Pvt (chauffeur)	1 Unit Equipment Set #5 (welding)
	1 Pvt (welder)	1 Unit Equipment Set #6 (electric generator)

		1 Motor Vehicle Mechanic Set 1 Set Pioneer Equipment Motor Vehicle
4-ton wrecker	2 Pvts (mechanics)	1 Tool Set, welders 1 (air compressor)
	1 Pvt (chauffeur)	1 Bar Towing Universal 1 Unit Equipment Set #9 (Ground Anchor Assembly) 2 Motor Vehicle Mechanic Sets 2 Sets Pioneer Equipment Motor Vehicle

MOBILE CREWS—Four of them, each organized as follows:

Vehicle	*Personnel*	*Equipment*
½-ton	2 Pvts (mechanics)	2 Motor Vehicle Mechanic Sets 1 Set Pioneer Equipment Motor Vehicle

The instructor explains that regulations prescribe no standard method of loading the equipment, supplies, and personnel of the maintenance section. The maintenance officer of this regiment is a recent graduate of the Motor Maintenance Course at The Infantry School and the loading we see was worked out by the operations section of the automotive group and is used for instructional purposes at The Infantry School.

Orders for the march provide that all motor vehicles, except those employed on the march for command, reconnaissance and communications, move under regimental control with Captain Service Company in command.

It is now 7:00 AM. The foot elements moved out two hours ago. We join Captain Service Company and learn that the motors are to make the move in two bounds, the first bound to start at 7:30 AM. The regimental transport officer, with four men to be used as guides, has gone forward to select covered areas near the road for the intermediate halt, and to arrange to meet the column and guide the trucks into the areas selected. As we move about the bivouac area we see that the battalion transport officers are in charge of the vehicles of their battalions including those of the battalion medical sections and the transport sergeant of headquarters company, being the senior, is in charge

of the vehicles of his company and the antitank company and the headquarters section of the medical detachment. Transport corporals and sergeants supervise while drivers check their vehicles. A mobile maintenance crew from the maintenance section has joined each battalion and the headquarters and antitank company group, and are prepared to render any assistance necessary.

There is no formation within the bivouac area. In order that they may not delay the columns when it comes their turn to move, drivers make sure that their vehicles are on solid ground. If necessary they move their vehicles a few lengths ahead. As far as practicable, they locate the vehicle they are to follow.

Captain Service Company gives the signal and the leading march unit moves out. Drivers in turn pull out from their concealed positions and the column forms and moves out at the prescribed speed and with proper intervals. Everything moves quietly and efficiently. The mobile maintenance crews follow their respective battalions and the maintenance section of the service company, less the mobile crews, follows the tail of the regimental column.

Having seen the motor column form and get under way, we move out to pass the column and select a good point along the route from which to observe the column as it passes.

As we ride along, the instructor explains that normally on a march of this length where there is no probability of interference by hostile ground troops, the motors would move in one bound either preceding or following the foot elements. In this situation, however, orders from higher headquarters would not permit such a movement.

We find a good point to stop and observe the column where the road passes over a hill and the route can be seen for a considerable distance in either direction.

Soon the head of the column appears and shortly thereafter we see a vehicle pull off the road, just short of the crest of the hill. The driver stops the truck as far to the right as the ditch along the road permits, dismounts, and waves the column past.

The instructor exclaims, "Good", and then points out that whenever a vehicle in a column is forced to halt, it should always be moved, pushed, or towed off the road, if possible, as far to the right as the road will permit. The driver should then signal the remainder of the column to continue the march. Otherwise, particularly at a place like this where the driver in rear is not able to see the remainder of the column, he may interpret the truck stopping as an order to halt.

We identify the truck which has stopped as belonging to one of the heavy weapons companies. Another truck of the company pulls up and halts in rear of the first; a man dismounts, examines the vehicle, talks briefly with the driver, and is off again.

The instructor explains that this is apparently the company motor mechanic who sees that he lacks the necessary part, tools, or equipment to repair the truck, so he goes on, after explaining to the driver that he is leaving it for the mobile maintenance crew, which will be along shortly.

Soon we see the last vehicle of the battalion pass and following it comes the truck with the mobile maintenance crew. It pulls up and stops in rear of the stalled vehicle, the mechanic gets out, and apparently quickly diagnoses the trouble. One mechanic gets out his set of mechanic tools and a small part from the maintenance truck. The other mechanic mounts up and drives on. While the mechanic who remained behind is working, we see the driver of the stalled truck standing as a guard to warn oncoming traffic.

Again the instructor explains that frequently a stalled vehicle, while pulled as far to the right as possible, still does not leave the road entirely clear. The driver should be posted to warn oncoming traffic and as a safety measure for the mechanic. It is a good idea, he says, if maintenance crews carry some sort of marker, luminous at night, which can be used to protect mechanics making roadside repairs as well as to indicate to oncoming traffic that the road, particularly the shoulders, may not be entirely clear.

The mechanic completes the repairs, climbs in with the driver, and the vehicle joins the tail of the nearest unit.

They may maintain that position until the end of the march, or as the instructor explains, if orders permit, on a long movement they may go ahead at the next halt and take their proper place in column.

Another truck has dropped out nearby and again we see the mobile maintenance crew pull up. We walk over to see what happens, and hear the mechanic explain that the distributor housing is cracked and shorted and that he has no spare part to replace it. The driver of the disabled truck then said, "How about giving me a tow?" After some discussion with his partner, one mechanic explains that they would tow the truck in if the bivouac were only a short distance, but since it is quite a ways in and the shop group is coming along in the rear, the driver is to wait for that group. The mobile maintenance crew mount up in their ½-ton truck and are off to rejoin their battalion, leaving the driver of the stalled truck watching for the regimental maintenance section.

From our vantage point on the hill we look back along the road and soon we see the big wrecker truck, which brings up the rear of the column, appear far down the road. A crash nearby causes us to turn quickly and we see that for some unknown reason a truck left the road just as it passed the crest of the hill and plunged into the ditch alongside the road. Apparently no one is hurt for we see two men dismount from the driver's seat and walk around the truck to examine the damage. By this time the maintenance officer has arrived and the regimental maintenance section has pulled up and halted off the road.

We see the maintenance officer and the staff sergeant (chief mechanic) examine the two vehicles and return to the trucks of the maintenance section. Soon two of the 1½-ton trucks of the maintenance section pull out and follow the regimental column, leaving two 1½-ton trucks and the wrecker.

Again we move closer so we can see and hear what is taking place. We find that one of the trucks left behind contains parts, while the other contains the tools needed. A mechanic gets the part needed for the stalled truck and goes to work.

We walk over to the truck which landed in the ditch and see at a glance that it is badly damaged. The right front wheel is off and the front axle is badly bent. We see the maintenance officer write some data on a tag and tie it to the steering wheel of the truck. Meanwhile, we hear the motor of the other stalled truck start up. We see the maintenance officer signal its driver to pull up by the ditched truck and hear him direct the drivers of the two trucks to transfer the load of the ditched truck to the one which has been repaired. The driver of the wrecked truck is directed to take his loose tools and equipment and ride on into bivouac with the truck to which his load has been transferred.

The mechanics mount up, the maintenance officer and the staff sergeant climb into the ¼-ton truck, and the group is off to rejoin the balance of the section up ahead.

We, too, mount up and soon approach the tail of the motor column, just in time to see it disappearing into a wooded area adjoining the road. We continue along the road and are fortunate in finding that the foot elements are just falling out for a periodic halt as we catch up with them. We take advantage of this halt to pass the column.

As we ride along the instructor explains that the truck which was abandoned was a third or fourth echelon maintenance job. The tag which was attached to its steering wheel indicated the organization to which it belonged and the repairs which the maintenance officer's inspection disclosed were needed. He also explained that had there been no truck available to which the load could be transferred, the driver would have been left behind as a guard.

We enter a town and come to a road fork. Two soldiers wearing signs hung around their necks are sitting by the side of the road. The instructor laughs and says, "Believe it or not, some people call those *"Animate Markers."* One of the signs indicates that the marker belongs to the regiment we are observing. We stop and inquire which route the regiment is to take. After receiving the information we proceed, and as we drive along the instructor unloads one of his pet ideas. "Experience has shown," says he, "that for an organization to make a march or motor move-

ment efficiently and smoothly certain things are necessary; among other things, an advance party consisting of a reconnaissance group and a quartering party must precede the column. The reconnaissance group has two separate missions, one to reconnoiter and make necessary minor road repairs, particularly at the point where vehicles are to leave the road, and the other to mark the route and protect the column from accidents at railroad crossings and other dangerous intersections. This is a regimental function and yet nowhere in the table of organization do we find men readily available. Normally, the regimental S-1 or the captain of the headquarters company, who acts as Headquarters Commandant, is properly placed in command of the advance party and is in direct charge of the quartering party. So far all is well. However, for pioneer men for the party it is necessary to go down to one of the battalions and take men and equipment from the ammunition and pioneer section. A man or two from each of the intelligence and communications platoons of headquarters company complete this group. The route marking party needs intelligent men of soldierly appearance who have had special training in traffic direction and control, but where are you going to get them? There just isn't any suitable organization in the regiment from which to take them. Some regiments having bands, use its members. I understand there is a possibility that in the near future there may be a small unit added to the division for route marking and traffic control. This would solve a part of the problem. I'd like to see a group provided in the headquarters company for these jobs and to act as a security force around regimental headquarters in the field. With all these parachute troops and armored reconnaissance vehicles in modern armies, command posts need protection. Such a unit would solve both problems.

"Then, too, there is the question of transportation for these details. While we have 256 motor vehicles allotted to an infantry regiment (not counting the 15 trailers), everyone of them has a prescribed load which will fill it to at least its rated capacity. Where is the regimental commander

to get the trucks to carry these advance groups and for a trail vehicle to pick up the markers after the tail of the column has passed? I'll tell you what most outfits are doing now; they just aren't playing the ammunition situation, and so they get along. It seems to me that the higher authorities would realize that even at best, no organization can keep its vehicles operating on a 100% basis all the time and that, therefore, some spares are needed for replacement of vehicles temporarily off the dispatcher's line and for occasional loads which are required."

At this point we reach the entrance to the bivouac area and see a man standing under cover from aerial observation but in full view of the road. He wears a regimental sign. Nearby we see an officer whom we recognize as the regimental S-1. We pull off the road, halt under cover and join him. The instructor, seeking information for his report, asks a number of questions and we learn that the quartering group consisted of S-1, in charge, the assistant regimental surgeon, one officer from each battalion and an enlisted man from each company and detachment, including one man from the service company. Each of the enlisted men was provided with a sign which is luminous at night. The instructions given the commander of the advance party (S-1) included:

a. Time of departure.

b. Composition of party, including when and where personnel and equipment would report.

c. Route of column and destination, including desired reconnaissance of alternate routes.

d. Time and place to meet staff officer of higher echelon (when applicable).

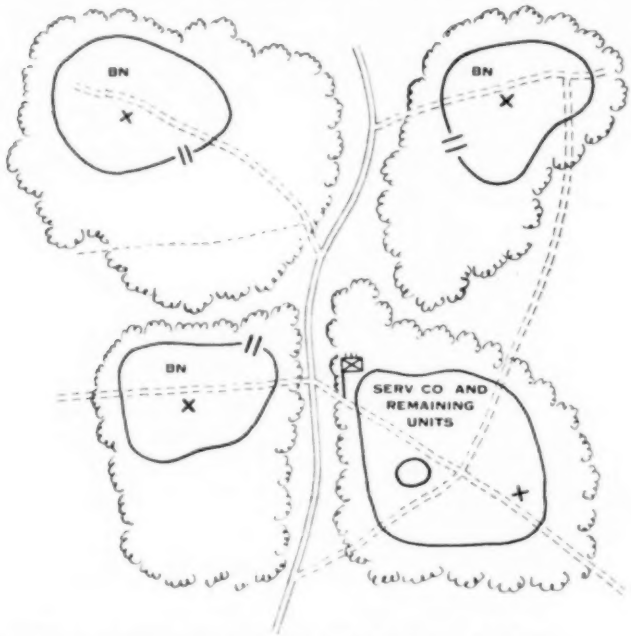
e. Order of march of the column.

f. Approximate time column is to arrive at destination.

g. Time and means for reporting findings to the column commander.

Upon arriving at the area assigned the regiment by higher headquarters, the quartering officer makes an inspection of the entire area and subdivides it into four areas one of which is allotted to each battalion and one to the

separate companies. The officer from each battalion then reconnoiters his area and suballots it to companies. Each company representative then reconnoiters his area, selects the best route thereto and takes post to intercept his company and guide it to its assigned area. The quartering officer suballots the area for separate companies and prepares a sketch for the information of the regimental commander showing the location of all units of the regiment in bivouac. We make a copy of his sketch (See Figure 35), thank him for the information he has furnished, and get back in our transportation to take a quick look at the bivouac area. When we reach the area allotted to the service



X—Mobile Crews From Regimental Maintenance Section.

O—Regimental Maintenance Section, less Mobile Crews.

FIGURE 35.—A regimental bivouac in a situation where secrecy is desired but no interference is expected from hostile ground forces.

company, we see a man whom we recognize as belonging to the maintenance section. He is moving around apparently looking for something. We stop and talk with him. He tells us that the maintenance section is to be set up near the cross roads in the woods and that he is looking over the area for good places for spotting the various vehicles. He says that he is trying to apply the principles of dispersion, camouflage, and concealment that the maintenance officer has talked about. After he has decided on the various locations he says he will take his post under cover along the road in order to intercept the maintenance section and guide it into its area.

We continue on our inspection of the area and observe the guides of the various companies awaiting their units. We return to the point where we left the quartering officer and see the head of the foot column arrive. While watching the foot column pass, we ask the instructor about the disposition of the trains in a tactical situation when the trains are bivouacked some distance to the rear of the combat units.

He draws us a diagram and makes certain explanations of which we make notes. (See Figure 36.)

The column of foot troops has passed and the instructor says, "The head of the motor column should arrive now at any moment and we will see the acid test of an organization's training in marching. You can be sure that if an outfit can get its motor column off the road and into a concealed bivouac without confusion and without permitting vehicles to jam up and halt in the open, you have a good unit. The ability to do this depends very largely on the proper training and employment of guides."

The motor column appears, and we see the marker at the entrance to the bivouac area direct the trucks into the area. With each battalion, as it rolls by, we see the mobile crew of the regimental maintenance section following the tail of its particular battalion.

As the motors leave the road and enter the woods, we notice that each small group or single vehicle leaving the column is preceded by a guide on foot.

The instructor explains that, prior to the start of any motor movement, one man on each vehicle is designated to act as a guide if necessary. When the vehicle is required to leave the road, either alone or at the head of a group, this man dismounts, and leads it on foot. Whenever visibility is poor, as at night or in moving through heavy underbrush, these guides on foot serve a two-fold purpose, protecting tired men who are apt to lie down to sleep or rest at every opportunity, and selecting a route so as to avoid holes, stumps, rocks, or other obstructions not visible to the driver, and which may damage the vehicle.

Here comes the regimental maintenance section. We accompany it to its area and see the quartering party guide, who has been watching for it, lead it off the road. He hurries ahead and as each truck enters the bivouac area he points out the general position he has selected for it. A man dismounts and leads the truck to the area where it is stopped under cover. The driver gets out, looks around, and then returns to his truck, and after maneuvering it around, backs it into position and cuts his motor. Again he dismounts and walks toward the exit from the area.

The instructor explains that once his general parking area is designated it is up to each driver to park his truck in such a manner as to conceal it from view from the air and so that he can move out quickly in case of an emergency even without lights. It was for the purpose of selecting his route to the exit that the driver made his reconnaissance immediately after parking his truck. If cover against aerial observation is insufficient, it is the driver's responsibility to conceal his truck, using his camouflage net when necessary.

The maintenance officer arrives and seems to be pleased with the area allotted to him. We ask him what particular features he has found important for a maintenance section bivouac. He replies that he likes to be near the center of the bivouac of the motors of the regiment, where it is convenient not only to the service company but to all. Cover from the air is also essential, heavy foliage being particularly desirable as it permits the mechanics to work at night

with properly shielded lights. Firm standing is necessary so that rain will not mire down the facilities. Finally, a good entrance and exit, shielded from hostile observation, will permit vehicles to move freely in and out of the area.

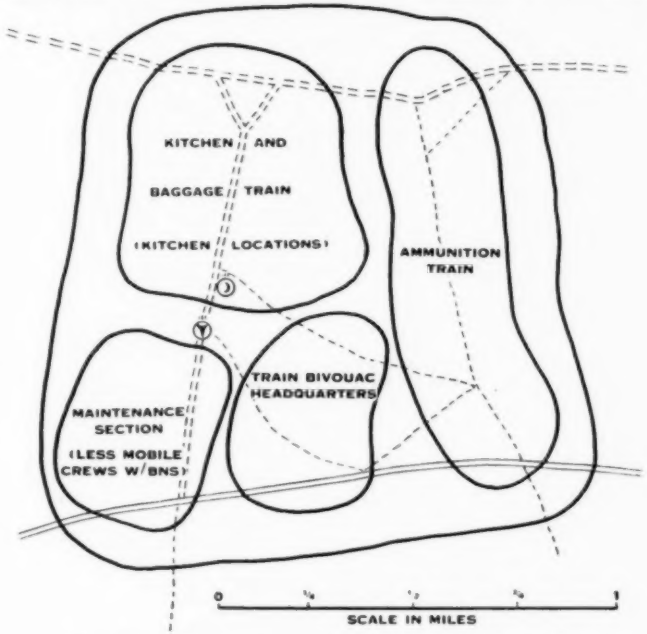


FIGURE 36.—Regimental Train Bivouac. (In Combat)—

¼ square mile to 1 or 2 square miles, depending on concealment, road net, and features favoring defense against air and mechanized attack. Out of range of probable hostile light artillery fires.

The regimental trains, less components released to battalion control, are bivouacked during combat under control of the regimental or higher commander, under the direct command of the service company commander, or under an officer, usually the transport officer to whom the command may be temporarily delegated by the service company commander.

The width, depth, area, and interior arrangement of the regimental train bivouac will vary within wide limits in different situations, depending primarily on the road net, concealment afforded, and features favoring defense against mechanized attack.

In combat, the maintenance section operates in and from the regimental train bivouac.

The regimental S-4 stops and confers briefly with the maintenance officer, who reports that all motor vehicles are in with the exception of the one which was left along the road for the third echelon to pick up.

S-4 makes a note of the exact location of this truck and says he will notify the division quartermaster maintenance unit and also ask the division quartermaster to furnish a replacement. As he leaves he remarks that the regimental commander insists that one of his staff check with the maintenance officer as soon as possible after every march in order that he may know the status of his vehicles.

We visit one of the battalion bivouac areas and find the motors are well dispersed and camouflaged. There is no tendency to regularity, yet on checking we find that they have been grouped by sections and platoons.

The instructor calls our attention to the fact that the drivers are all working on their vehicles. He remarks that these driver inspections made before starting, during each scheduled halt, and at the end of a march or a day's work, are the very heart of motor maintenance.

A sharp exclamation attracts our attention. The transport corporal of a platoon has stopped a driver about to leave the area. It develops that the driver has failed to make the required inspection of his vehicle. He is cautioned to do so without delay, and attend to his personal affairs later.

The driver goes back and starts the inspection of his motor vehicle, but in a careless manner. This attracts the attention of the platoon transport corporal, and the sergeant to whose squad this vehicle is assigned. It is not long before this driver is given thoroughly to understand what is required. There is no doubt in our minds that between the supervision of these two noncommissioned officers, the delinquent driver will make a correct and complete inspection of his vehicle.

A driver to our immediate front is making the required inspection of his vehicle. He proceeds in a very businesslike manner, seems to know exactly what to do, and works rapidly.

We move closer and follow him in his inspection. From our observations and remarks of the instructor, we learn that the driver should, at the conclusion of each day's march, or upon completion of a day's work—

(a) Inspect fuel, water, brake fluid, and lubricant for leaks.

(b) Check tires for cuts, breaks, and improper inflation.

(c) Inspect for lost parts (grease fittings, hub, and radiator caps, etc.) and for loose bolts, nuts, and other fastenings.

(d) Check tools and equipment.

(e) Service the vehicle; that is, replenish fuel, engine lubricant (oil), water, and other necessary operating supplies. After making this check, the driver should note anything unusual that may have occurred during the day, with particular reference to—

(1) Engine overheating, knocking, or missing.

(2) Defective brakes.

(3) Unusual noises.

(4) Clutch and transmission trouble.

(5) Abnormal operation of oil and temperature gauges.

(6) Ammeter and other instruments registering improperly.

(7) Flat tires.

(8) Defective lights or electrical troubles.

(9) Loss of tools, equipment, or cargo.

Defects or any abnormal condition that cannot be corrected by the driver must be reported to his immediate superior for corrective action.

We are impressed by the fact that, unless properly supervised by the responsible officers and noncommissioned officers, these important motor vehicle inspections by the drivers may be neglected, or performed in a careless manner, or omitted entirely.

The instructor explains that when these inspections are completed and the reports of defects received, battalion transport officers are in a position to assist the mobile maintenance crews with their battalions in the planning of their maintenance work.

We observe that as each driver inspects his fuel tank, he takes one of the five-gallon containers carried on the truck and fills his tank. Empty cans are carried by the drivers and placed in a pile at a point convenient to the entrance to the battalion bivouac area. We discuss gas and oil supply with the battalion transport officer. He tells us that it is standard procedure in this regiment for drivers to refill from reserve cans and stack empty containers as we have seen. From there on procedure varies, but in most instances either S-4 of the battalion or the battalion transport officer load the empty cans in one of the battalion trucks, and exchange them for full ones at the regimental distributing point. Occasionally, exchange is made at the division gas and oil distributing points. When these operations must be performed at night, which frequently happens, he explains that special precautions are taken. Transport corporals or sergeants have their drivers sleep in a prescribed location. They, in turn, sleep at a place designated by the battalion transport officer. In this way, when the fuel arrives, no time is lost hunting for personnel in the dark. The drivers are awakened and refueling is completed.

We start for another battalion area to observe its operations and enroute the instructor explains that the system of gas and oil supply varies widely in different organizations. The Tables of Basic Allowances (October 1, 1941) provide for the issuance of either one 10 gallon or two 5 gallon containers per gasoline consuming motor vehicle except passenger cars and motorcycles. In many organizations such as this one, hangers have been improvised and these containers are carried on the various vehicles. This leaves no containers available for carrying a reserve supply of gasoline and oil under regimental control. In other words, the entire reserve is carried on the individual vehicles and is out of control of commanders. The present thought is that pending the authorization of additional containers, in the usual situation, the bulk of these containers should be carried on the five 1½-ton trucks provided in the service company for hauling reserve gas and oil. This sup-

ply is allocated to battalions and separate companies by S-4 under policies determined by the regimental commander. Thus, when a shortage exists, commanders concerned can make an allocation, either providing a partial supply for all or, when desirable, giving preference to certain vehicles as dictated by the tactical and administrative situation.

When this is done, filled containers are delivered to the various organization bivouacs by a representative of S-4. Gasoline is then allotted to vehicles by transport officers or commander concerned; drivers get their allotted amount, place it in their vehicles, and return the empty containers to the supply truck which brought it.

Experience indicates that oil should be drawn on a basis of approximately three percent of the gas requirements in gallons. The oil may be issued in expendable commercial containers.

Either of these systems of refueling has several advantages. Vehicles remain in the bivouac area available for inspection and maintenance. The unit remains intact under the commander's control and is ready to move quickly if need be. Only two or three vehicles per regiment go to the gasoline distributing point instead of all the vehicles of the unit, thus reducing congestion on roads and at the gas distributing points.

He also adds that command and administrative vehicles which move individually take advantage of any opportunity offered to refill at gasoline and oil distributing points established by higher units.

We enter another battalion area and find the battalion transport officer talking to a driver. It appears that a vehicle belonging to the heavy weapons company of the battalion requires a minor brake adjustment. We hear the battalion transport officer tell the driver that the motor mechanic of the company should be able to make the necessary adjustment.

We approach another vehicle. The engine is running, the hood is up, and the driver listening intently. The battalion transport officer also stops. A strange noise comes from

the engine. "A broken valve spring," says the driver. The vehicle is a weapon carrier of one of the rifle companies. There being no motor mechanic with a rifle company, and since the job of repair will require some parts and special tools, the battalion transport officer advises the driver that the mobile maintenance crew with the battalion will be sent over to make the necessary repairs.

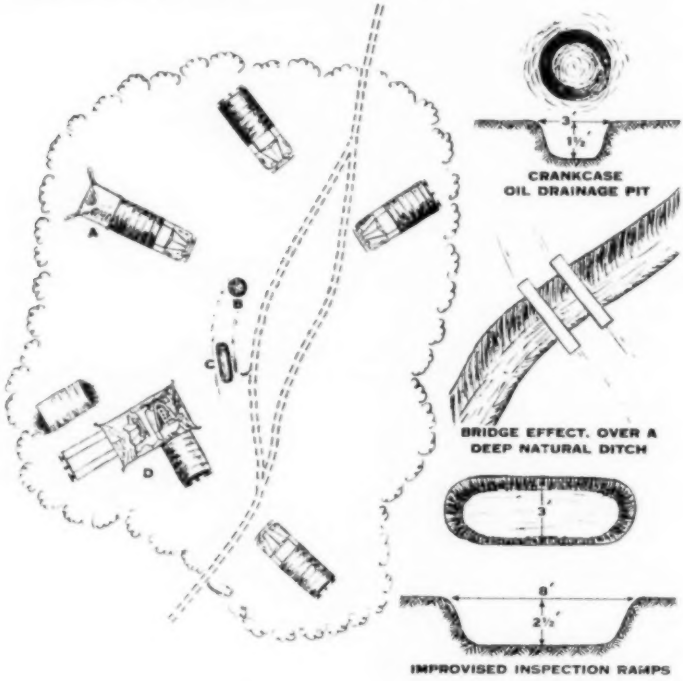


FIGURE 37.—Maintenance Section and Expenditures.

A—Maintenance truck with improvised canvas shelter in rear.

B—Crankcase oil drainage pit.

C—Improvised inspection ramp.

D—Setup for night work. Maintenance truck playing headlights on vehicle to be repaired. Direct rays subdued and diffused by several thicknesses of blue cellophane. Entire setup then covered by a piece of canvas.

At our look of inquiry, the instructor explains that this crew which is in touch with the regimental maintenance section of which it is a part, is able to secure assistance or such parts and special tools as required.

We now return to the area occupied by the regimental maintenance section of the service company. We find the shop group all set up and ready to function. They have the four 1½-ton trucks and the 4-ton wrecker spotted in their area. See Figure 37 for a sketch of the general layout, and Figure 37 for some of the expedients employed.

For easy identification each vehicle displays a number inside the windshield. Very little equipment has been unloaded. Vehicles are spotted in a convenient location, and the tools and equipment arranged conveniently at hand. We see a crankcase oil drainage pit, simply a hole dug in the ground to dispose of the oil drained. They are just completing an improvised inspection ramp by deepening a hollow spot on the ground. The maintenance officer states this is well worth while if the section is to remain in one location for more than a few hours.

We move about the area, and the instructor explains the various operations which we watch.

Here a crew is attaching a piece of canvas from the rear end of their truck to a nearby tree in rear of the vehicle, so as to form a shelter under which mechanics can work in inclement weather. At another point mechanics are removing the bows and paulin from a truck. These, set down on the ground, form an improvised hut under which some of the mechanics may work. The truck may still be used for its regular purpose.

Here a crew is engaged in some sort of preparation. There are two vehicles, one apparently requiring repairs that will take some time. One of the vehicles is faced toward the other so that its headlights may be played on the parts in need of repair during darkness. We note that the headlights are covered by two or three thicknesses of blue cellophane, held on by a rubber band. To conceal the direct rays of the lights, a piece of canvas is stretched to cover the hoods of both vehicles including the intervening space.

The staff sergeant chief mechanic checks the setup, and seems to be well satisfied. We learn that friendly air service has checked upon this expedient and reported satisfactory results. The trouble light issued to the mechanics is covered with blue cellophane. The chief mechanic tells us that he often dips the bulbs in prussian blue paint or dye, which seems equally satisfactory.

There are many different types of shelters that may be prepared to provide cover for mechanics in inclement weather. However, the instructor explains, there will be times when the situation or terrain will not permit the erection of any type of shelter, since it may give away the position to hostile air observation.

Someone enters the area and we hear him ask for the maintenance officer. We recognize him as one of the mechanics of the mobile maintenance crew with the 1st Battalion.

Upon locating the maintenance officer he states that he has a vehicle at the 1st Battalion in need of a repair for which he needs a part. The maintenance officer approves the issue of the part and indicates the vehicle by number, where the mechanic may secure it. Before leaving, the mechanic also requests some other small parts to replace those which he used during the day on the march. These also are supplied.

A mechanic from the 2d Battalion mobile maintenance crew drives up in his ½-ton maintenance truck. He reports that there is a vehicle in the 2d Battalion area which the mobile maintenance crew is unable to repair because of lack of special tools and equipment. Should he tow the vehicle over, or will the shop group send a mechanic with additional equipment and the special tools required? We hear the maintenance officer advise him to go back to his battalion and tow the disabled vehicle to the shop group.

The instructor explains that the moving of vehicles in and out of the shop group area must be carefully considered and weighed by the maintenance officer in each instance. In some situations it may be inadvisable to permit a vehicle to move or be towed into the area, no matter

how desirable it may appear from a mechanic's point of view. A large or towed vehicle moving into the maintenance section area, is more apt to be discovered by hostile air observation than, for example, a ½-ton maintenance truck from one of the battalions, which may be used to call for and deliver the help, and necessary tools and parts, to the broken down vehicle. This will permit the vehicle to be repaired without moving it.

As the instructor finishes this explanation we hear a truck entering the area. The motor is missing and it is evident that something is wrong. The driver seems at a loss to know where to turn, and starts to bring his truck to a halt at a point where it would be exposed to view from the air and also where it would block the entrance. The chief mechanic hurries over to the truck and guides it into a suitable position where he directs the driver to park. The maintenance officer joins the chief mechanic, and we hear the driver report that he is from Company I, and that the mobile maintenance crew with the 3d Battalion was unable to make the necessary repairs and had told him how to find the shop group. The maintenance officer and the chief mechanic locate the trouble quickly, and a mechanic is detailed to do the job.

Another man approaches the maintenance officer and we hear him report that his engine had very little power and he was bringing his truck in for repair. He hit a bad stretch of ground, the motor stalled, and now he is stuck. As he pointed down the trail we can see the truck and notice that it is out in the open.

The maintenance officer promptly gives an order and the staff sergeant mechanic sends out a 1½-ton truck with a front mounted, power-operated winch. We move a short distance and watch while the cable is unwound and hooked onto the stalled truck with the use of a spreader bar (see Figure 38), which, the instructor explains, is to prevent the frame of the towed vehicle from being bent inward in front. The stuck vehicle is pulled by the winch onto solid, level ground from where it can proceed under its own power to the designated location in the shop area.

However, the winch truck chooses a poor spot to halt, and it is stuck now. No one seems much concerned. They run the cable to a nearby tree, and the winch truck pulls itself out by merely causing the cable to wind up on the drum of its winch.

FIGURE 38.

While we are watching these operations the instructor explains as follows: "Under present Tables of Basic Allowances, we have in the Infantry Regiment, 74 vehicles equipped with front-mounted, power-operated winches. The winch of the 1½-ton truck is equipped with 100 yards of ½-inch cable. It will sustain a load of 18,000 pounds; however, a shear pin is provided as a safety device, which prevents damage to the winch machinery and limits the load to 10,000 pounds. Therefore, an ordinary bolt or other substitute should not be used to replace the shear pin, as damage may result to the winch machinery.

"The ½-ton truck winch has about one-half the capacity of the 1½-ton truck winch. The 1½-ton truck winch has a high and low speed and a reverse, while the ½-ton truck winch has but one speed and a reverse.

"The best power combination in the use of the winch is to operate the winch in the highest power that will do the job, and have the stalled vehicle assist in the lowest gear that will give traction. If the stalled vehicle cannot get traction, the best assistance it can give is to release its brakes and let the winch do the job. Otherwise, the wheels of the stalled vehicle will merely spin around and dig itself in deeper, making the job for the winch more difficult.

"The winch has an automatic self-energizing brake, which prevents spilling or dropping the load if the shear pin should break, or while the control unit is shifted by the operator.

"The motor should not be raced in using the winch. The gears in the winch are designed for a motor speed of about 1000 r.p.m., equal to about 15 mph in high gear. The gear ratio is 30 to 1."

We return to the shop group area and see the staff sergeant mechanic and the maintenance officer in conversation. We listen in. The staff sergeant mechanic reports that there is a shortage of motor vehicle parts. A number of parts were used up in the repair of vehicles of the column while on the march. Also, the mechanics of the mobile maintenance crews have drawn parts for the purpose of repairs and replenishing their stock of parts. Someone will have to go to the third echelon shops of the division quartermaster for a resupply, and the staff sergeant mechanic wants to know whether he should start back to get the parts.

The maintenance officer instructs him to have the clerk of the maintenance section prepare a list of the parts required, while he, the maintenance officer, will visit the battalion transport officers and mobile crews in order to determine whether they have any further needs before sending for the parts. Upon his return, the staff sergeant mechanic is to be prepared to go for the parts.

The instructor explains that this is common practice for expendable parts and those which are exchanged. Nonexpendable equipment and large requisitions are obtained through S-4.

The staff sergeant mechanic also asks what to do about a vehicle that the wrecker towed in. At first it appeared that the shop group would be able to make the necessary repairs, but further examination disclosed the fact that it would take too long, and that it was distinctly a third echelon job requiring special tools.

The maintenance officer instructs the staff sergeant mechanic to find out from the division maintenance officer,

at the time he goes for the parts, whether or not the division 3d echelon motor repair shop can come and get the vehicle in question before the regiment moves from the area. If not, the vehicle is to be marked and tagged, indicating what is wrong with the vehicle and the designation of the organization, and left there for the maintenance section division quartermaster battalion to pick up later.

Again the instructor explains that under this system the 3d echelon calls for vehicles which an operating organization, such as a regiment, cannot repair with the 2d echelon tools and equipment available. Should the repairs take a considerable length of time, the issuing service may be requested to replace the vehicle. Under actual operations, it may be possible to replace vehicles direct from a pool at 3d echelon.

What is this? Unless our eyes deceive us, here is a ½-ton command and reconnaissance truck, entering the area under its own power, with but three wheels. We approach for a closer inspection, and see that a wooden skid takes the place of the missing rear wheel. Since no one seems to take much notice, but accepts it as commonplace, we speak to the driver.

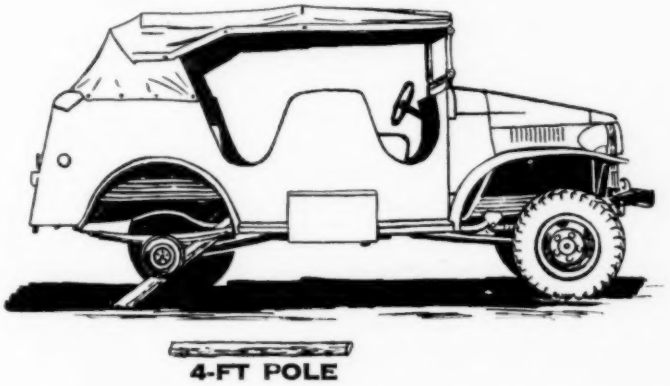
The driver states that a short distance back he lost the rear right wheel in an accident. Since the wrecker was busy elsewhere, he was ordered by the maintenance officer to place a skid on the vehicle and bring it in under its own power.

We examine this skid, and find it to be nothing more than a four-foot section of a small sapling, cut by the driver. It is placed over a cross member of the vehicle frame and under the rear axle, and tied at these points by two pieces of ½-inch rope about five feet long.

With the assistance of the driver of another vehicle, our driver had pried up the rear end of the vehicle with a small pole, also cut on the spot, and using logs at hand to hold the vehicle in a jacked-up position, applied the skid.

We look around and see the maintenance officer hurrying toward an official car picking its way among the trees, with one of the men of the maintenance section preceding it on

foot and guiding it off the trail. Someone dismounts from the vehicle, which is parked under cover. It is the regimental commander. We learn later that he, or a member of his staff, generally visits the battalion motor parks and the maintenance section during the repair period in an assembly or bivouac area.



The regimental commander inquires about the status of the motor vehicles and the state of repairs. We hear him direct the maintenance officer to concentrate on motor vehicle repairs of the 1st and 2d battalions, since they will leave early in the morning. The 3d Battalion being on another mission is to follow somewhat later.

After the colonel leaves, the instructor remarks that we have just seen one of the main reasons that the motor vehicles of this regiment operate so efficiently. The commander takes a personal interest in seeing that the maintenance officer is provided with necessary information to enable him to establish priorities on maintenance and plan his work in accordance with the tactical situation. Also the mere appearance of the regimental commander in the maintenance section bivouac makes all concerned feel that their job is of real importance.

SUMMARY

In summary, all training in motor vehicle maintenance should stress efficient maintenance and operation of motor vehicles in the field. One method may prove just as effective as another; however, operation under field conditions must not be forgotten in any program of training.

The method of training adopted should emphasize —

a. A careful instruction of drivers, not only in the operation of their vehicles, but also in the performance of their duties in 1st echelon maintenance.

b. The proper organization of a bivouac or assembly area, and the providing of a suitable location for the maintenance section and crews.

c. Prompt servicing of vehicles, and routine motor vehicle inspections by all ranks concerned, upon reaching such an assembly or bivouac area.

d. Timely organization of maintenance crews, instructions as to their duties, and furnishing these crews with adequate transportation, tools, equipment, and such parts and supplies as past experience indicates are essential for the particular type of transportation used, and the mission at hand.

e. Proper supervision by all leaders, and economy in the use of mechanics.

f. An efficient, systematic, periodic maintenance inspection of all vehicles by all echelons within the regiment.

This all may be termed PREVENTIVE MAINTENANCE, which pays big dividends and keeps the wheels rolling.

TOOL-SETS (COMPLETE WITH TOOLS) MOTOR-VEHICLE-MECHANICS'

Stock No. 41-T-3538

Figure Number	Stock Number	COMPONENTS	QUANTITY
1	41-B-155	BARS, cross, for hinged socket handle, diameter of ½", length 10"	1
2	41-B-1157	BLADES, saw, hack, hand, type-A, all hard, length 12", width ½" or 9/16", points per inch 24	12
3	41-B-1840	BOXES, tool, loose-tray, OD, length 21", width 8-½", depth 7-5/16"	1
		CHISELS, Machinists', Hand—	
		Width of Cut / Length	
4	41-C-1052	Cape — ¼" — 7"	1
5	41-C-1106	Cold — ½" — 6"	1
6	41-C-1124	Cold — ¾" — 8"	1
7	41-C-1168	Diamond Point — ⅜" — 6"	1
8	38-C-300	CLEANERS, file	1
9	41-D-1514	DRIFTS, brass, round, size 1" x 7"	1
		FILES, American-Standard—	
10	41-F-862	Flat, Bastard, length (point to shoulder) 10"	1
11	41-F-886	Flat, Smooth, length (point to shoulder) 10"	1
12	41-F-950	Half-Round, Smooth, length (point to shoulder) 6"	1
13	41-F-1304	Round, Bastard, length (point to shoulder) 8"	1
14	41-F-1553	Three-Square-Cut, Bastard, length (point to shoulder) 8"	1
15	41-F-3390	FRAMES, hack-saw, adjustable, straight-handle, type-A, capacity 8" to 12"	1
16	41-G-400	GAGES, thickness—	
		Range of thickness, number of leaves, / length of case—	
		0.0015) 0.002, 0.003) 0.004, 0.006) 0.008, 0.010) 0.012, 0.015) — 9 — 3-⅜"	1
		HAMMERS, Machinists', Ball-Peen, weight—	
17	41-H-523	16-ounces	1
18	41-H-527	32-ounces	1
		HANDLES, file-and-tool—	
		Designation / Largest Diameter of Handle (Grip)	
19	41-H-1116	Medium — 1-¼"	2
20	41-H-1117	Small — 1"	3

TOOL-SETS (COMPLETE WITH TOOLS) MOTOR-VEHICLE-MECHANICS'

Stock No. 41-T-3538

(Continued)

Figure Number	Stock Number	COMPONENTS	QUANTITY
21	41-H-1500	HANDLES, socket-wrench, flexible-head, spinner-type, 10-½", ½" square drive	1
22	41-H-1501	HANDLES, socket-wrench, off-set, double-end, 1-¾" x 6-¾", 1/" square drive	1
23	41-K-546	KNIVES, putty, type IV, width of blade, 1-¼"	1
24	13-O-1530	OILERS, steel, straight spout, spring bottom, capacity ½-pint, diameter 3"	1
25	41-P-1650	PLIERS, combination, slip-joint, wire cutting type, length (overall) 6"	1
26	41-P-1714	PLIERS, diagonal-cutting, length (overall) 6"	1
27	41-P-3185	PUNCHES, center, type II, octagon-or-round (knurled), Diameter of stock ⅜", length (approximate) 4-½"	1
		PUNCHES, drive-pin, type VIII, Class-C solid taper,	
		Diameter	
28	41-P-3640	⅛"	1
29	41-P-3642	¼"	1
30	41-P-3644	⅜"	1
31	41-R-2990	RULES, steel, spring-tempered, English-scale, Length 6"	1
32	41-S-665	SCRAPERS, carbon, 10-spring-steel-wire	1
		SCREWDRIVERS, common, type-III, heavy-duty, integral—	
		Handle, Class-B, length of blade—	
33	41-S-1076	6"	1
34	41-S-1078	10"	1
35	41-S-1385	SCREWDRIVERS, machinists, extra-heavy-duty, wood-insert-Handle, length of blade 5" only	1
36	41-S-1063	SCREWDRIVERS, close quarter, type II, length of blade 1-¾"	1
37	41-S-2806	SHEARS, Tinners', hand, combination, type-C, length of cut, 1-¾", length (overall) 7"	1
		WRENCHES, adjustable, crescent type,	
		Jaw Opening (minimum) Length (overall)	
38	41-W-486	15/16" 8"	1
39	41-S-488	1-5/16" 12"	1

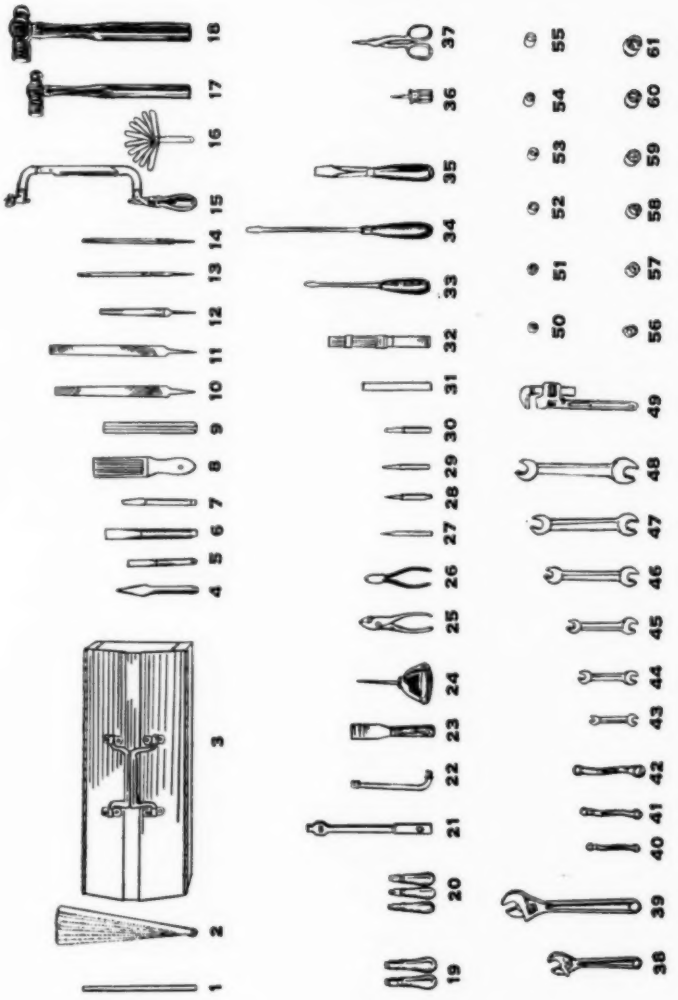


FIGURE 39.—Tool-Sets (Complete with Tools) Motor-Vehicle Mechanics'.

Stock No. 41-T-3538

TOOL-SETS (COMPLETE WITH TOOLS) MOTOR-VEHICLE-MECHANICS'

Stock No. 41-T-3538

(Continued)

Figure Number	Stock Number	COMPONENTS	QUANTITY
		WRENCHES, box double-head, short, off-set-type,	
		Dimensions of openings—	
40	41-W-620	3/8" and 7/16"	1
41	41-W-622	1/2" and 9/16"	1
42	41-W-625	5/8" and 3/4"	1
		WRENCHES, Engineers, 15° angle, double-head, open-end,	
		Dimensions of openings—	
43	41-W-991	3/8" and 7/16"	1
44	41-W-1003	1/2" and 19/32"	1
45	41-W-1005-5	9/16" and 11/16"	1
46	41-W-1008-10	5/8" and 25/32"	1
47	41-W-1012-5	3/4" and 7/8"	1
48	41-W-1021	15/16" and 1"	1
49	41-W-1662	WRENCHES, pipe, adjustable, type II, heavy-duty, pipe capacity (maximum) 1", length 10"	1
		WRENCHES, socket, without-handle, double-hexagon opening, 1/2" square drive, size—	
50	41-W-3005	7/16"	1
51	41-W-3007	1/2"	1
52	41-W-3009	9/16"	1
53	41-W-3011	19/32"	1
54	41-W-3013	5/8"	1
55	41-W-3015	11/16"	1
56	41-W-3017	3/4"	1
57	41-W-3019	25/32"	1
58	41-W-3021	13/16"	1
59	41-W-3023	7/8"	1
60	41-W-3025	15/16"	1
61	41-W-3027	1"	1

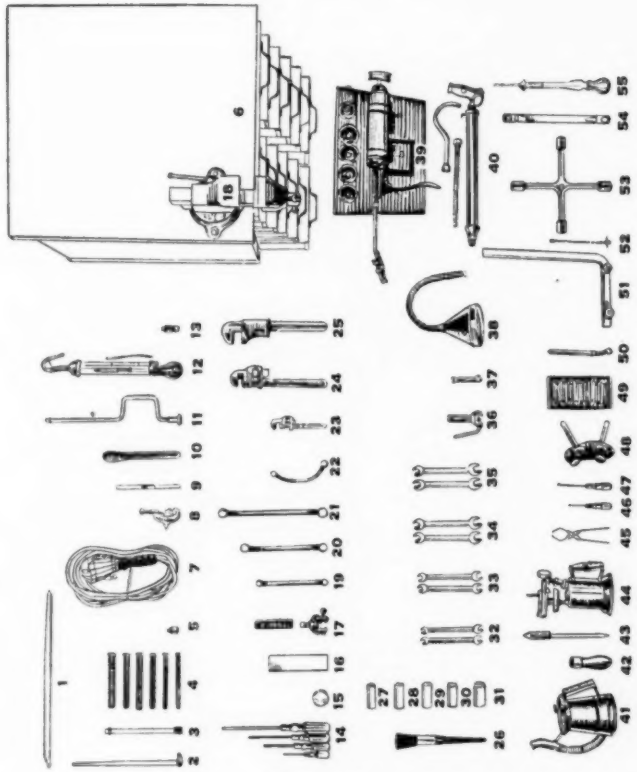


FIGURE 40.

TOOL-SETS (COMPLETE-WITH-TOOLS) UNIT EQUIPMENT, SECOND ECHELON SET NO. 1

Stock No. 41-T-3545-10

Figure Number	Stock Number	COMPONENTS	QUANTITY
		(GENERAL SHOP AND REPAIR EQUIPMENT)	
1	41-B-255	BARS, Jimmy, length 24"	1
2	41-B-292	BARS, pry, rolling-head-type	1
3	41-B-309	BARS, socket-wrench, extension, ½"-square-drive, length 10"	1
4	41-B-530	BENDERS, copper-tube, sizes ½", 5/16", ⅜", 7/16", ½" and ⅝"	1

Figure Number	Stock Number	COMPONENTS	QUANTITY
		(GENERAL-SHOP-AND-REPAIR-EQUIPMENT)	
5	41-B-645	BITS, socket-wrench, drag-link, ½"-square-drive	1
6	41-C-15	CABINETS, tool, steel, with-drawers-and-bench-top	1
7	41-C-35079	CORDS, extension, complete-with-clip, 15-feet, 6-volt	1
8	41-C-2825	CUTTERS, copper-tube, sizes ⅛" to ⅝"	1
9	41-F-1525	FILES, thread-restorer	1
		HANDLES, socket-wrench-	
10	41-H-1505	Rachet, ½"-square-drive, 10"-length, with-plug	1
11	41-H-1508	Speeder, ½"-square-drive, 15" length	1
12	18-H-940	HYDROMETERS, anti-freeze-solution, scale (alcohol, glycerine-and-prestone)	1
13	41-J-380	JOINTS, socket-wrench, universal, ½"-square-drive	1
14	41-S-1630	SCREWDRIVERS, recessed-screw, (Phillips-type) Nos. 1, 2, 3 and 4 set	1 set
15	41-S-2390	SETTERS-and-EXTRACTORS, stud, socket-wrench, ½"-square-drive, ¼" to ⅝"	1
16	41-S-5416	STONES, sharpening, type II, unmounted, Class-A, combination one-face-coarse, other-face-fine, thickness 1" width 2", length 8"	1
17	41-T-3125-20	TOOLS, flaring, copper-tubing, 3/16" to ½"	1
18	41-V-272	VISES, Machinists', type VII, Class-B, bench, swivel-base, stationary-jaw, opening of jaw 4", width-of-jaw 3"	1
25	41-W-452	WRENCHES, adjustable, automobile type, length (overall) 15", jaw opening 3-⅝"	1
		WRENCHES, box, double-head, long, double-hexagon-	
19	41-W-603	15° angle, 11/16" x ¾"	1
20	41-W-605	15° angle, 13/16" x ⅞"	1
21	41-W-608	15° angle, 15/16" x 1"	1
22	41-W-635	WRENCHES, box, starter-and-manifold-nut, ⅝" x 9/16"	1
		WRENCHES, pipe, adjustable, type II, heavy-duty-	
23	41-W-1661	8"-length	1
24	41-W-1663	14"-length	1

Figure Number	Stock Number	COMPONENTS	QUANTITY
		(ENGINE-REPAIR-EQUIPMENT	
26	38-B-3345	BRUSHES, sash tool, oval, No. 5, 1-7/16" x 1-1/16"	1
		WRENCHES, spark-plug, double-hexagon-	
27	41-W-3325	½"-square-drive, 13/16"	1
28	41-W-3326	½"-square-drive, ⅞"	1
29	41-W-3327	½"-square-drive, 15/16"	1
30	41-W-3328	½"-square-drive, 1"	1
31	41-W-3329	½"-square-drive, 1-⅛"	1
		WRENCHES, tappet, double-end-	
32	41-W-3573	7/16" x ½"	2
33	41-W-3579	9/16" x ⅝"	2
34	41-W-3582	11/16" x ¾"	2
35	41-W-3585	13/16" x ⅞"	2
		(MOTORCYCLE EQUIPMENT)	
36	41-T-3320	TOOLS, repair, drive-chain, motorcycle, universal-type, drop-forged	1
37	41-W-1575	WRENCHES, nipple, spoke, motorcycle, universal-type	1
		(LUBRICATING-EQUIPMENT)	
38	41-F-3592	FUNNELS, galvanized, with-flexible-tube, capacity, 1-quart	1
39	41-G-1327	GUNS, lubricating, pressure, cartridge-type, capacity, 1-pound	1
40	41-G-1365	GUNS, oil, suction-type, (differential-and-transmission)	1
41	41-M-940	MEASURES, steel, with-flexible-spout, capacity, 1-quart	1
		(SHEET-METAL-AND-RADIATOR-EQUIPMENT)	
42	41-H-1510	HANDLES, soldering-iron	1
43	41-I-702	IRONS, soldering, non-electric, pyramid-point, weight per pair, 2 pounds	1
44	41-T-3645	TORCHES, gasoline, cylindrical, capacity, 1 quart	1
		(IGNITION-AND-CARBURETOR-REPAIR-EQUIPMENT)	
45	41-P-1815	PLIERS, headlight-bulb	
		SCREWDRIVERS, electricians, length of blade-	
46	41-S-1225	2-½"	1
47	41-S-1228	5-½"	1
48	41-T-3215	TOOLS, headlight-lens, removing-and-installing	1

Figure Number	Stock Number	COMPONENTS	QUANTITY
49	41-W-900	WRENCHES, electrical (midget in sets), 7-wrenches in leatherette roll, openings 13/64" to ⅜"	1
		(TIRE-REPAIR-EQUIPMENT)	
50	8-G-375	GAGES, tire-pressure, 10-to-160-pounds	1
51	41-S-4163	SPREADERS, tire, hand-operated	1
52	41-T-3378	TOOLS, tire-valve-stem-fishing	1
53	41-W-2025	WRENCHES, rim-nut, 4-way	1
		(BATTERY-REPAIR- EQUIPMENT)	
54	41-C-445	CARRIERS, storage-battery	1
55	18-H-1240	HYDROMETERS, storage - battery - testing, with-case	1

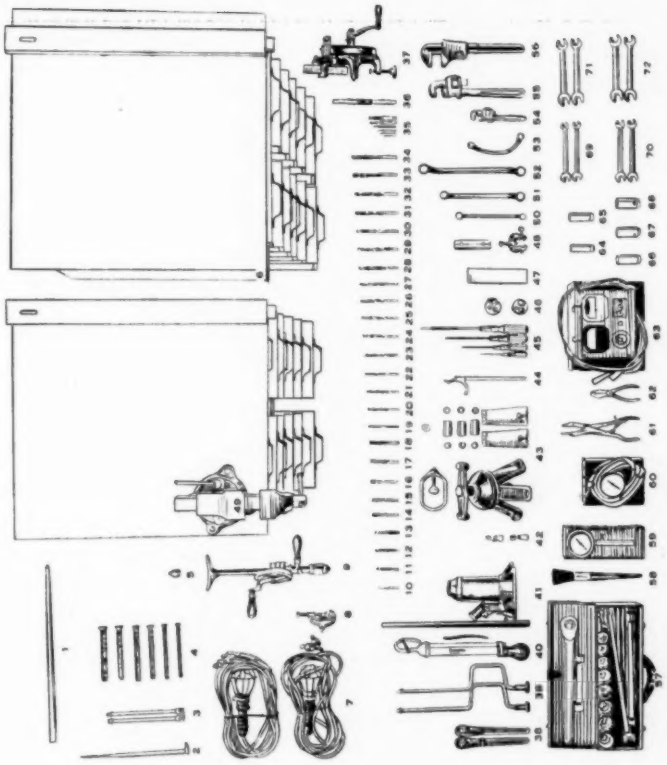


FIGURE 41.

TOOL-SETS (COMPLETE-WITH-TOOLS) UNIT EQUIPMENT.
SECOND ECHELON SET NO. 2
Stock No. 41-T-3545-11

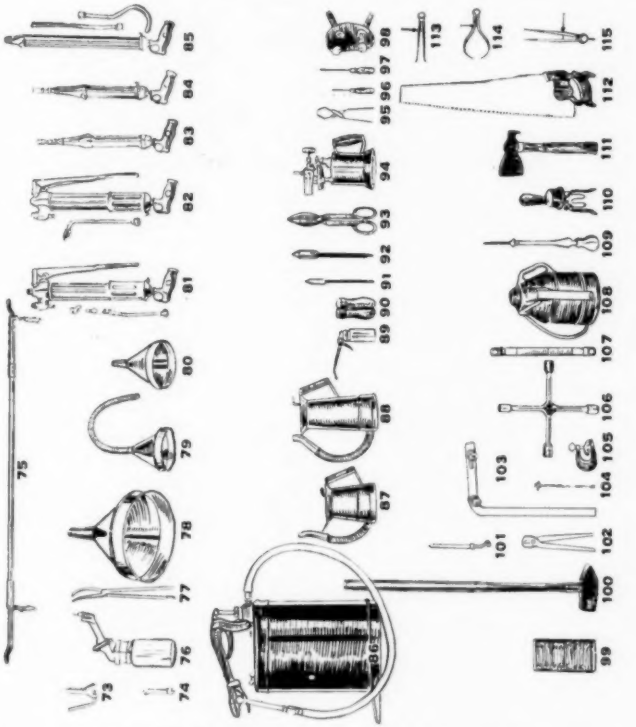
Figure Number	Stock Number	COMPONENTS	QUANTITY
		(GENERAL-SHOP-AND-REPAIR-EQUIPMENT)	
1	41-B-255	BARS, Jimmy, length 24"	1
2	41-B-292	BARS, pry, rolling-head-type	1
3	41-B-309	BARS, socket-wrench, drag-link, ½"-square-drive, length 10"	2
4	41-B-530	BENDERS, copper-tube, sizes ¼", 5/16", ⅜", 7/16", ½" and ⅝"	1

Figure Number	Stock Number	COMPONENTS	QUANTITY
		(GENERAL-SHOP-AND-REPAIR-EQUIPMENT)	
5	41-B-645	BITS, socket-wrench, drag link ½"-square-drive	1
6	41-C-15	CABINETS, tool, steel, with-drawers-and-bench-top	2
7	17-C-35079	CORDS, extension, complete-with-clips, 15-feet, 6-volt	2
8	41-C-2825	CUTTERS, copper-tube, ⅛" to ⅝"	1
9	41-D-1663	DRILLS, breast, type-A, plain, capacity of chuck ⅛" to ½"	1
		DRILLS, twist, high-speed-steel, straight-shank, fractional sizes, single, long set	
		Diameter — Length (overall)	
10	40-D-1805	⅛" — 5-⅛"	2
11	40-D-1806	9/64" — 5-⅜"	2
12	40-D-1807	5/32" — 5-⅜"	2
13	40-D-1808	11/64" — 5-¾"	2
14	40-D-1809	3/16" — 5-¾"	2
15	40-D-1810	13/64" — 5-7/8"	2
16	40-D-1811	7/32" — 5-7/8"	2
17	40-D-1812	15/64" — 6-⅛"	2
18	40-D-1813	¼" — 6-⅛"	2
19	40-D-1814	17/64" — 6-¼"	1
20	40-D-1815	9/32" — 6-¼"	1
21	40-D-1816	19/64" — 6-⅜"	1
22	40-D-1817	5/16" — 6-⅜"	1
23	40-D-1818	21/64" — 6-½"	1
24	40-D-1819	11/32" — 6-½"	1
25	40-D-1821	23/64" — 6-¾"	1
26	40-D-1821	⅜" — 6-¾"	1
27	40-D-1822	25/64" — 7"	1
28	40-D-1823	13/32" — 7"	1
29	40-D-1824	27/64" — 7-¼"	1
30	40-D-1825	7/16" — 7-¼"	1
31	40-D-1826	29/64" — 7-½"	1
32	40-D-1827	15/32" — 7-½"	1
33	40-D-1828	31/64" — 7-¾"	1
34	40-D-1829	½" — 7-¾"	1
35	41-E-560	EXTRACTORS, screw, in-sets (Nos. 1-6)	1
36	41-F-1525	FILES, thread-restorer	1
37	41-G-872	GRINDERS, bench, hand-power, diameter of wheel 6"	1

Figure Number	Stock Number	COMPONENTS	QUANTITY
		(GENERAL-SHOP-AND-REPAIR-EQUIPMENT)	
		HANDLES, socket-wrench-	
38	41-H-1505	Rachet, ½"-square-drive, 10"length, with- plug	2
39	41-H-1508	Speeder, ½"-square-drive, 15"-length	2
40	18-H-940	HYDROMETERS, anti-freeze-solution, scale (alcohol, glycerine-and-prestone)	1
41	41-J-73-5	JACKS, automobile-and-motor-truck, type-VII, hydraulic, Class-C, 7-ton capacity	1
42	41-J-380	JOINTS, socket-wrench, universal, ½"-square-drive	2
43	41-P-2960	PULLERS, wheel, universal	1
44	41-R-2380	REMOVERS, dust-and-inner-hub-cap, front-wheel	1
45	41-S-1630	SCREWDRIVERS, recessed-screw, (Phillips'-type), Nos. 1, 2, 3 and 4, set	1
46	41-S-2390	SETTERS-and-EXTRACTORS, stud, socket-wrench, ½"-square-drive, ¼" to ⅝"	2
47	41-S-5416	STONES, sharpening, type II, unmounted, class-A, combination one-face-fine, thickness 1", width 2", length 8"	1
48	41-T-3125-20	TOOLS, flaring, copper-tubing, 3/16" to ½"	1
49	41-V-272	VISES, Machinists, type-Vii, class-B, bench, swivel-base, stationary-jaw, opening of jaw 4", width of jaw (minimum) 3"	1
		WRENCHES, box, double-head, long, double-hexagon -	
50	41-W-603	15° angle, 11/16" x ¾"	1
51	41-W-605	15° angle, 13/16" x ⅞"	1
52	41-W-608	15° angle, 15/16° x 1"	1
53	41-W-635	WRENCHES, box, starter-and-manifold-nut, ⅝" x 9/16"	1
		WRENCHES, pipe, adjustable, type-II, heavy-duty, length	1
54	41-W-1661	8"	1
55	41-W-1663	14"	1
56	41-W-452	WRENCHES, adjustable, automobile type, length (overall) 15", jaw opening 3-⅝"	1
57	41-W-2620	WRENCHES, socket, (sets), with-ratchet-handle, extension-bar, universal-joint-and-sliding-T-handle, ¾"-square-drive, 8-sockets, 12-point, 1-1/16" to 1-⅝"	1

Figure Number	Stock Number	COMPONENTS	QUANTITY
		(ENGINE-REPAIR-EQUIPMENT)	
58	38-B-3345	BRUSHES, sash tool, oval, No. 5, 1-7/16" x 1-1/16"	1
59	41-G-124	GAGES, cylinder, compression, universal-type	1
60	41-G-500	GAGES, vacuum, carburetor-adjusting-and-fuel-pump-testing	1
61	41-L-1410	LIFTERS, valve, universal	1
62	41-R-2398	REPLACERS, valve, lock-key	1
63	41-T-5550	TESTERS, volt-ampheres, with-variable-rheostat, and-test-leads	1
		WRENCHES, spark-plug, double-hexagon-	
64	41-W-3325	½"-square-drive, 13/16"	1
65	41-W-3326	½"-square-drive, ⅞"	1
66	41-W-3327	½"-square-drive, 15/16"	1
67	41-W-3328	½"-square-drive, 1"	1
68	41-W-3329	½"-square-drive, 1-⅛"	1
		WRENCHES, tappet, double-end-	
69	41-W-3573	7/16" x ½"	2
70	41-W-3579	9/16" x ⅝"	2
71	41-W-3582	11/16" x ¾"	2
		WRENCHES, tappet, double-end-	
72	41-W-3585	13/16" x ⅞"	2
		MOTORCYCLE-EQUIPMENT)	
73	41-T-3320	TOOLS, repair, drive-chain, motorcycle, universal type, drop-forged	1
74	41-W1575	WRENCHES, nipple, spoke, motorcycle, universal-type	1
		(WHEEL-ALIGNMENT-EQUIPMENT)	
75	41-G-510	GAGES, wheel-aligning, correcting-toe-in	1
		(BRAKE-REPAIR-EQUIPMENT)	
76	41-F-2980	FILLERS, hydraulic-brake, master-cylinder	1
77	41-P-1579	PLIERS, brake-spring	1
		(LUBRICATING EQUIPMENT)	
		FUNNELS, galvanized-	
78	41-F-3590	Reinforced-spout, capacity 8-quarts	1
79	41-F-3592	With-flexible-tube, capacity 1-quart	1
80	41-F-3593	Without-flexible-tube, capacity 2-quarts	1
		GUNS, lubricating, pressure-	
81	41-G-1330-60	Lever-type, high-pressure, 1-pound, chassis-lubricating	1
82	41-G-1330-75	Lever-type, low-pressure, universal-joint, 1-pound	1

Figure Number	Stock Number	COMPONENTS	QUANTITY
83	41-G-1344-25	Push-type, high-pressure, water-pump	1
84	41-G-1344-50	Push-type, medium-pressure, wheel-bearing	1
85	41-G-1365	GUNS, oil, suction-type (Differential-and-transmission)	1



86	41-G-1425	GUNS, pump (bucket), lubricating, with-flexible-hose, capacity 25 pounds	1
		MEASURES, steel, with-flexible-spout, capacity-	
87	41-M-940	1-quart	1
88	41-M-941	2-quart	1
89	13-O-400	OILERS, small, hand, trigger-operated	1
		(SHEET METAL-AND-RADIATOR-EQUIPMENT)	
90	41-H-1510	HANDLES, soldering-iron	2

Figure Number	Stock Number	COMPONENTS	QUANTITY
		IRONS, soldering, non-electric, pyramid-point, size (weight per pair)	
91	41-I-700	1-pound	1
92	41-I-702	2-pound	1
93	41-S-2813	SHEARS, tinners', hand (snips), straight-cut, type-A, length of cut 3", length (overall) 12-¾"	1
94	41-T-3645	TORCHES, gasoline, cylindrical, capacity 1-quart	1
		(IGNITION-AND-CARBURETOR-REPAIR-EQUIPMENT)	
95	41-P-1815	PLIERS, headlight-bulb	1
		SCREWDRIVERS, electricians', length of blade-	
96	41-S-1225	2-½"	1
97	41-S-1228	5-½"	1
98	41-T-3215	TOOLS, headlight-lens, removing-and-installing	1
99	41-W-900	WRENCHES, electrical (midget in sets), 7-wrenches in leatherette roll, opening 13/64" to ⅜"	1
		(BLACKSMITHS-EQUIPMENT)	
100	41-S-3702	SLEDGES, blacksmiths', cross-peen, weight 8-pounds	1
		(TIRE REPAIR EQUIPMENT)	
101	8-G-375	GAGES, tire-pressure, 10-to-160 pounds	1
102	41-P-2000	PLIERS, tire-chain-repair	1
103	41-S-4163	SPREADERS, tire, hand-operated	1
104	41-T-3378	TOOLS, tire-valve-stem-fishing	1
105	41-V-600	VULCANIZERS, schaler-type	1
106	41-W-2025	WRENCHES, rim-nut, 4-way	1
		(BATTERY-REPAIR-EQUIPMENT)	
107	41-C-445	CARRIERS, storage-battery	1
108	8-F-1000	FILLERS, battery, distilled-water, unbreakable-bottle-type	1
109	18-H-1240	HYDROMETERS, storage-batter-testing, with-case	1
110	17-T-5505	TESTERS, battery-volt	1
		(WOOD-WORKING-EQUIPMENT)	
111	41-H-1632	HATCHET, claw, width of cutting edge 4"	1
112	41-S-185	SAWS, crosscut, type-N (hand), length of cutting edge 24", points per inch 8	1
		(MACHINISTS-EQUIPMENT)	
113	41-C-344	CALIPERS, spring, inside, size 6"	1
114	41-C-354	CALIPERS, spring, outside, size 6"	1
115	41-D-1368	DIVIDERS, spring, type-A, size 8"	1

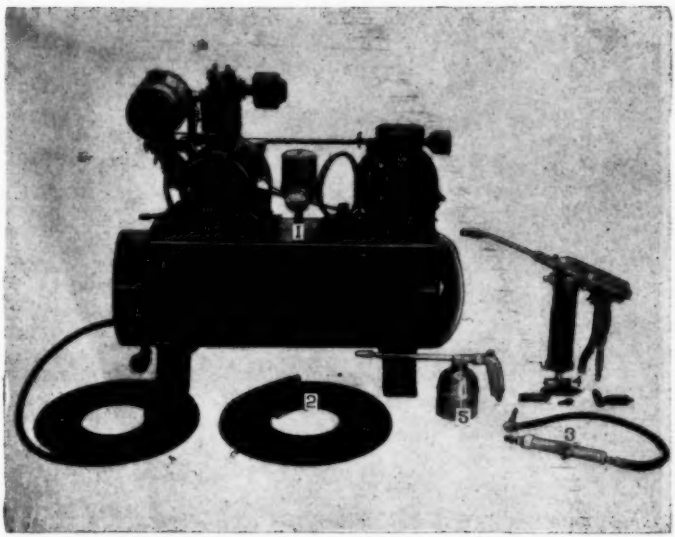


FIGURE 42.

TOOL-SETS (COMPLETE-WITH-TOOLS) UNIT EQUIPMENT, SECOND ECHELON SET NO. 3

Stock No. 41-T-3545-12

Figure Number	Stock Number	COMPONENTS	QUANTITY
		AIR-EQUIPMENT-SET	
3	8-C-5300	CHUCK-GAGES, tire-pressure, 15-to-70 pounds, in 5-pound units	1
5	40-C-1008-20	CLEANERS, engine, kerosene-spray, 1-quart-cup	1
1	66-C-1369	COMPRESSORS, air, portable, gasoline-driven, with tank, ½ H.P., 3-cu.-ft.-capacity	1
4	40-G-498-25	GUNS, lubricating, air-operated, high-pressure, 1-pound, chassis-lubrication	1
2	33-H-120	HOSE, air, ¼"-inside-diameter, 25-foot-length, with connection	1

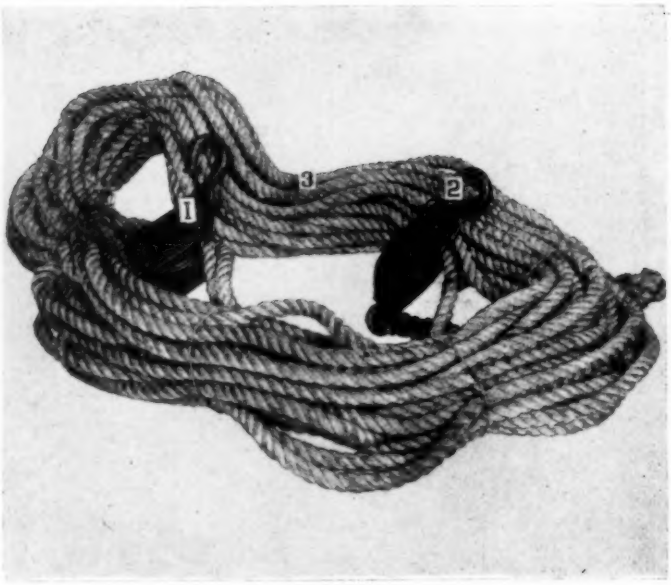


FIGURE 43.

TOOL SETS (COMPLETE WITH TOOLS) UNIT EQUIPMENT.
SECOND ECHELON SET NO. 4
Stock No. 41-T-3545-13

Figure Number	Stock Number	COMPONENTS	QUANTITY
		BLOCK-AND-TACKLE-SET	
1	19-B-8830	BLOCKS, ordinary, for-manila-rope, iron-shell-and-sheaves, galvanized, double-sheave, hook, single, side-loose, without-becket, size of block 8", diameter-of-rope 1"	1
2	19-B-8890	BLOCKS, ordinary, for-manila-rope, iron-shell-and-sheaves, galvanized, single-sheave, hook, single, side-loose, with-becket, size of block 8", diameter-of-rope 1"	1
3	21-R-418	ROPE, manila, 3-strand, circumference 3" diameter 1"	300 Ft.

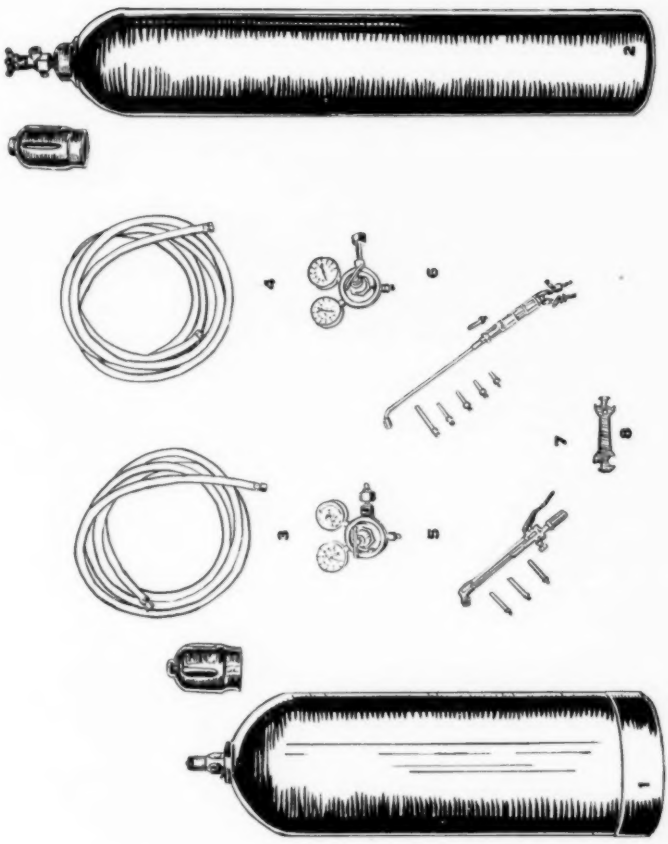


FIGURE 44.

TOOL SETS (COMPLETE WITH TOOLS), UNIT EQUIPMENT, SECOND ECHELON SET NO. 5

Stock No. 41-T-3545-14

Figure Number	Stock Number	COMPONENTS	QUANTITY
1	51-G-120	(A) GASES, acetylene, 225-cubic feet, cylinder	1

Figure Number	Stock Number	COMPONENTS	QUANTITY
2	51-G-225	(A) GASES, oxygen, 200-cubic-feet-cylinder	1
3	33-H-398	HOSE, gas, acetylene, with-couplings, diameter inside 5/16", length 12-½'	1
4	33-H-452	HOSE, gas, oxygen, with-couplings, diameter inside 5/16", length 12-½'	1
5	45-R-3502	REGULATORS, cylinder, acetylene, cutting-and-welding, male-outlet, complete-with-two-gages with - adapter - from - commercial - to- "Presto - O - Lite" - welding - cylinder, gage graduation in pounds 50 and 500, size of pipe connection 9/16", 18-thread l.h., NF-3	1
6	45-R-3533	REGULATORS, cylinder, oxygen, cutting-and-welding, male-outlet, complete-with-two gages, gage graduation in pounds 200 to 3000, size of pipe connection 9/16", 18-thread, r.h., NF-3	1
7	41-T-3812	TORCHES, oxy-acetylene, welding, with-cutting-attachment, class B- medium-welding-and-cutting, torch capacity ½" welding, 5" cutting	1
8	41-W-1600	WRENCHES, oxy-acetylene-torch	1

- NOTE -

(A) To be procured locally as and when needed.

FIGURE 45.

TOOL-SETS (COMPLETE-WITH-TOOLS) UNIT EQUIPMENT, SECOND ECHELON SET NO. 7
Stock No. 41-T-3545-16

Figure Number	Stock Number	COMPONENTS	QUANTITY
		WRECKING-SET	
1	8-B-50	BARS, towing, universal-type	1

FIGURE 46.

TOOL-SETS (COMPLETE-WITH-TOOLS) UNIT EQUIPMENT.
SECOND ECHELON SET NO. 6
Stock No. 41-T-3545-15

Figure Number	Stock Number	COMPONENTS	QUANTITY
		ELECTRIC-GENERATOR-SET	
1	17-C-8760	CHARGER, battery, 300-watts, 12-volt, gasoline-engine-driven, without batteries	1
2	17-C-10580	CLIPS, universal, battery-use, 25-ampere-capacity	20

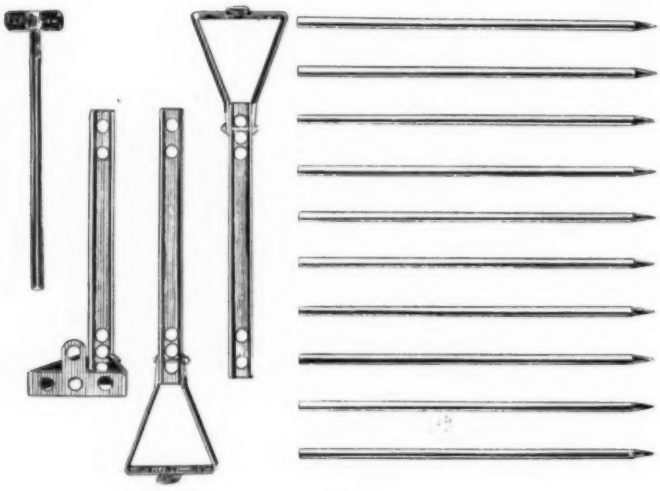


FIGURE 47.

TOOL SETS (COMPLETE WITH TOOLS), UNIT EQUIPMENT, SECOND ECHELON SET NO. 9

Stock No. 41-T-3545-18

Stock Number	COMPONENTS	QUANTITY (Per Set)
8-A-1200	ANCHOR, assembly, ground, military truck	3
41-S-3726	SLEDGE, blacksmiths', double face, wt. 10-lb. ..	1
8-S-8450	STAKES, ground, military truck	10

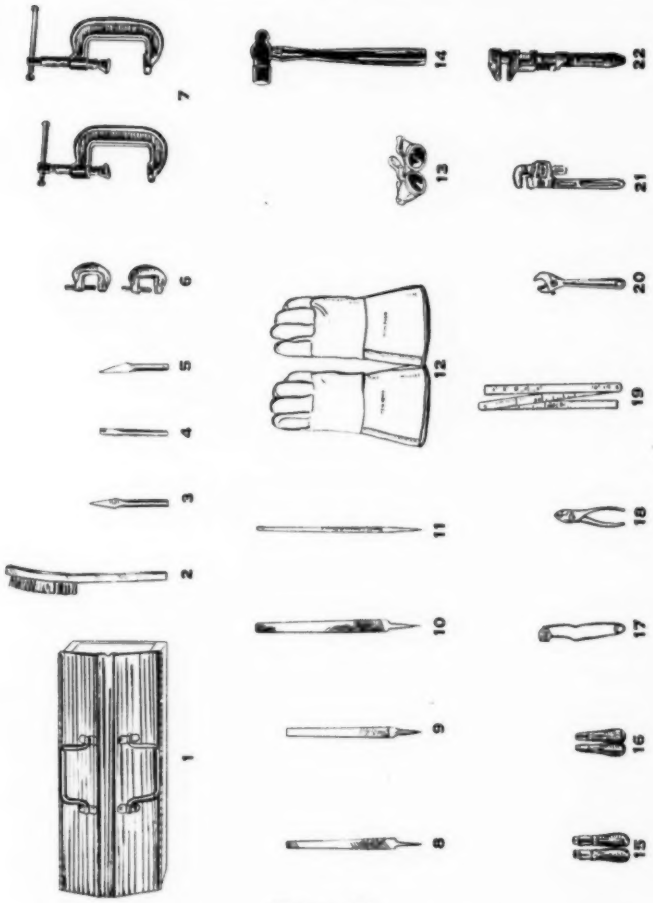


FIGURE 48.
TOOL-SETS COMPLETE-WITH-TOOLS) WELDERS'
Stock No. 41-T-3555

Figure Number	Stock Number	COMPONENTS	QUANTITY
1	41-B-1840	BOXES, tool, loose-tray, O. D., length 21," width 8-½", depth 7-5/16"	1
2	38-B-1005	BRUSHES, cleaning, steel-wire, medium-hard rectangular-handled, width 1-⅛"	1

Figure Number	Stock Number	COMPONENTS	QUANTITY
		CHISELS, Machinists' hand—	
		Width of cut Length	
3	41-C-1052	Cape ¼" 7"	1
4	41-C-1106	Cold ½" 6"	1
5	41-C-1241	Round Nose ⅜" 6"	1
6	41-C-1652	CLAMPS, C, heavy service, capacity 1-¼"	2
7	41-C-1730	CLAMPS, C, medium service, capacity 4"	2
		FILES, American-standard—	
8	41-F-862	Flat, bastard, length (point to shoulder) 10"	1
9	41-F-932	Half-round-bastard, length (point to shoulder) 10"	1
10	41-F-1158	Mill-bastard, length (point to shoulder) 12"	1
11	41-F-1307	Round-bastard, length (point to shoulder) 12"	1
12	37-G-2840	GLOVES, welders, heavy leather, with 6" lined gauntlet, large size	2 Pr.
13	37-G-3794	GOGGLES, welders, eyecup with lenses, shade No. 5	1 Pr.
14	41-H-527	HAMMERS, machinists', ball-peen, weight 32 ounces	1
		HANDLES, file-and-tool—	
		Designation Largest Diameter of Handle (Grip)	
15	41-H-1115	Large 1-½"	2
16	41-H-1116	Medium 1-¼"	2
17	41-I-50	IGNITERS, oxyacetylene-torch	1
18	41-P-1650	PLIERS, combination, slip-joint (wire-cutting-type), length (overall) 6"	1
19	41-R-2750	RULES, blacksmiths', steel, folding, length 36", 3 folds	1
20	41-W-486	WRENCHES, adjustable, cresent type, jaw opening (minimum) 15/16", length (overall) 8"	1
		ELECTRIC-GENERATOR-SET	
21	41-W-1662	WRENCHES, pipe, adjustable, type-II, heavy-duty, pipe capacity (maximum) 1", length 10"	1
22	41-W-2343	WRENCHES, screw, monkey, knife-handle, jaw opening (minimum) 2-⅛", length (overall) 12"	1

CHAPTER 8

Artillery-Infantry Team in the Triangular Division

IN WHICH TWO OLD FRIENDS GET TOGETHER AND SOLVE TO THEIR OWN SATISFACTION ONE OF THE BIG PROBLEMS FACING THE ARMY TODAY

PROLOGUE

In those hectic days of the late summer and early fall of 1940, hundreds of regular army officers, together with some thousands of reserve officers, found themselves transplanted from the relative sanctuary of a peace time assignment or a civilian job into the holocaust of expansion.

In this welter of long agonizing days and all too short nights, one of the brightest spots for many was the meeting of old friends and acquaintances wearing new insignia of advanced rank. And so we find Colonel Whitestripe, assigned to command a newly constituted infantry regiment, meeting an old friend, Lieutenant Colonel Redleg, organizing one of the artillery units in the same division.

SCENE 1

Time: October, 1940.

Scene: A room adjoining the office of the Division Adjutant General in an abandoned CCC Camp, now being used as division headquarters. The unit commanders are assembling prior to the daily conference of commanders and division staff officers. Colonel Whitestripe and Lieutenant Colonel Redleg enter together.

Colonel Whitestripe: I hear you have received some advance dope on a new Table of Organization for the artillery of the triangular divisions.

Lt. Col. Redleg: Yes, and they have sure done a thorough job of it, too. No more regiments; instead, we are to have four battalions, three light and one medium.

Colonel Whitestripe: Say, I'm having a meeting of all the officers of the regiment tomorrow afternoon at 5:00 o'clock to discuss the new infantry organization. How about having that fine recruit stenographer you were boasting about yesterday write up a brief summary of your new organization so I can give it to them.

Lt. Col. Redleg: Sh-h-h. Don't mention that man here where some of these brass hats might overhear you or I'll lose him. I'll be glad to send you the dope on the new organization.

Colonel Whitestripe: What are they doing about the new gun to replace the 75-mm? I've heard a lot about a 105-mm howitzer.

Lt. Col. Redleg: Yes, a new howitzer has been approved and production orders are out. I've never seen one except an early test model, but I have a picture of the model adopted which I'll send along with the memorandum.

Major Scribble (The Division Adjutant General): "Come in, gentlemen, and take seats, please. The Chief of Staff is coming."

Curtain.

MEMORANDUM FOR COLONEL WHITESTRIPE: Here is the dope I promised you; also the picture. I've added some data about the gun which may be of interest.

REDLEG.

The artillery of the infantry triangular division will consist of a division artillery headquarters battery, three battalions of light artillery (105-mm howitzer, truck-drawn), and one battalion of medium artillery (155-mm howitzer, truck-drawn). This artillery is commanded by a brigadier general known as the division artillery commander. In

general, the three light battalions are provided for the direct support of the three infantry regiments, and the medium battalion is provided for the general support of the division as a whole.

The division artillery headquarters battery consists of a command group, a command post group, and a communication group.

Each light battalion consists of a headquarters battery, three firing batteries, and a service and ammunition battery. The headquarters battery consists of headquarters, communication section, two liaison sections, and an antiaircraft and antitank platoon. Each firing battery has four 105-mm howitzers, an ammunition section, and a reconnaissence and communication detail. The service and ammunition battery consists of an ammunition train of three sections, a service platoon of two sections: a battalion supply section, and a battalion motor maintenance section. All batteries have a battery maintenance section which consists of mess, supply, and motor maintenance personnel.

The medium battalion has the same organization as that of the light battalion, except that the howitzers are 155-mm and there is an additional battery of eight 75-mm antitank guns in the battalion.

Each battalion has an attached surgeon and medical personnel.

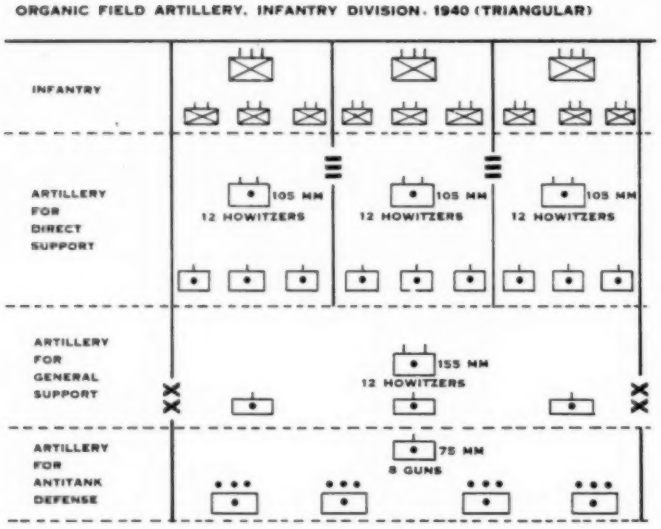


FIGURE 49.

FIGURE 50.—105-mm Howitzer.

SCENE 2

Time: January, 1941.
Scene: The office of Colonel Whitestripe at the headquarters 59th Infantry. The Colonel, seated at his desk, is reading a memorandum from division headquarters which deals at great length with the first division CPX which is to be held the following day. The regimental executive officer, S-1, S-2, and S-3 are standing about the office waiting for him to finish.

Enter: Lt. Col. Redleg.

Colonel Whitestripe: Hello, Redleg. I'm sure glad to see you. It seems from this memorandum I've just been reading that our outfits are going to see a lot of each other.

Lt. Col. Redleg: Yes, that's what I dropped around to talk about. I've heard a lot of lectures on "Infantry and Artillery" under various high sounding titles during the past 20 years but I've never seen two outfits really work together as effectively as I think they should. Since we are to be united in one of these new fangled "Combat Teams" I thought I'd drop around this afternoon in the hopes that we might "chew the fat" a while and see if we can't get together and start the building up of a team that will make them sit up and take notice.

Colonel Whitestripe: That's fine. Make yourself as comfortable as possible in that barrack chair. (The staff officers start to leave.) Wait a minute, gentlemen. If Colonel Redleg doesn't object, I'd like for you to stay. I am anxious that each of you become familiar with the details of Infantry-Artillery co-operation.

Lt. Col. Redleg: I surely don't object. I only wish I had thought to bring my executive along.

Colonel Whitestripe: Now to get back to the Infantry-Artillery team. Naturally I'm mighty interested in making this team really work. I remember back in 1929 General

Paul B. Malone was crusading for a new idea. He assembled all the officers of the Philippine Division at Fort William McKinley and really sold us on his idea of an Infantry-Artillery-Air Team. The only real trouble was that we were never able to make it work. The two big obstacles seemed to be that the infantry had no radios that could communicate with the air and the artillery, and the artillery never had sufficient officers, personnel, or communication equipment to operate the liaison details the plan required.

Lt. Col. Redleg: I've heard a lot about Malone's Infantry-Artillery-Air Team but never saw it tried on maneuvers. Of course, effective artillery fire as well as Infantry-Artillery cooperation is based upon communications. So far we have received very little in the way of communication equipment, particularly radio.

Colonel Whitestripe: We're in the same fix. We have just received four of the eight walkie-talkie sets allowed us by table of basic allowances and some of the new model telephones. I'm anxious to see how these radios work. I hope that the reason for the delay in the receipt of our other radios is that they are planning on issuing improved models of which I have heard rumors. I will sure be glad, though, when we get all the equipment prescribed by regulations. We can really do some training then. By the way, is it contemplated that radio will be used as a normal means of communication between an infantry regiment and its supporting artillery?

Lt. Col. Redleg: In general, no. Technically, however, it is possible for the infantry regiment to communicate direct with division artillery headquarters. Also, I understand the number of vehicular radio sets (SCR 245) is to be increased both in the infantry and the artillery. However, these sets are intended primarily for the division warning net and command net. The latest doctrine is that the best cooperation can be gained by personal contacts. Our present setup provides for this contact in three ways:

Command Liaison, Liaison Officers, and Forward Observers. It is to talk over the first of these that I really came over today.

Colonel Whitestripe: Well, that's fine. I suppose, then, after this meeting, the next time I'll see you will be after the exercise is over and we assemble for the critique.

Lt. Col. Redleg: By all means, no! That is the reason I am here. If my battalion is going to render any kind of support to your regiment, my plans must be based on what you are going to do. In order to do this our headquarters should be close together, particularly the initial set ups. Even though our headquarters are established close together, I propose to stay with you most of the time. When I leave for any reason at all, one of my staff officers, normally the executive, will remain at your Command Post. We will lay a wire line to your headquarters which will be extended to your new location in case your Command Post moves forward when mine can't. You see, the technical requirements of communications with the batteries for fire control must take precedence, and so we may not always be able to move at the same time you do.

Colonel Whitestripe: This "command liaison," as you call it, should surely facilitate joint planning of operations. I suppose that when a battalion commander wants artillery support, he calls on regimental headquarters and either you or your representative get it for him.

Lt. Col. Redleg: No, that's where the second type of personal contact I spoke about a minute ago comes in. We now have in the battalion two organic liaison sections which are sent to two front-line battalions and if the third battalion is committed, a third liaison section can be improvised using personnel and equipment from the other two or from battalion headquarters or one of the firing batteries. These sections have their own communication facilities: radio, telephone, visual signalling,

and messenger service. They function with the infantry battalion commanders by keeping them informed of the possibilities of artillery fire and arranging for the delivery of fires requested.

Colonel Whitestripe: Well, suppose one of my battalion commanders sees a target which he wishes to have taken under fire and points it out to the liaison officer. Does the liaison officer adjust the fire?

Lt. Col. Redleg: Yes. In addition to command liaison duties he frequently adjusts fire. However, this adjustment of fire is a secondary mission. The forward observers, who are the third type of contact between the infantry and artillery, may also adjust the fire. These forward observers are sent out by the batteries to establish observation posts close up to the infantry front line, where they are assigned zones or sectors of observation by the artillery battalion commander as determined by the terrain, the objective being to have them so located that all parts of the front are under observation by at least one forward observer. They contact the company commanders in these zones or sectors as well as the officers controlling the fires of the infantry heavy mortars.

Colonel Whitestripe: Between these three means of contact we surely should be able to get real artillery support, provided, of course, all who are concerned are familiar with their part and that applies to the infantry officers as well as the artillerymen. On this CPX tomorrow, we are to have headquarters down to include battalions represented. What artillery elements are to be out?

Lt. Col. Redleg: We are to have the divisions artillery headquarters and the battalion headquarters only. Batteries will not be included.

Colonel Whitestripe: The exercise is to open with the arrival of the regiment in its detrucking area following a motor movement in which the division, which has been in corps reserve, moves forward to make an attack at daylight.

Personnel to participate in the exercise are to be at the detrucking area at 2:00 AM where a staff officer is to meet us and deliver the division attack order.

Lt. Col. Redleg: That's my understanding of it. Theoretically my battalion is attached to your regiment for the movement so I'll join you at your temporary command post in the detrucking area to be present when the order arrives. It sure looks to me as if they have picked a difficult situation for the first exercise—moving into position for a daylight attack with no previous daylight reconnaissance. Well, I must be on my way to check up on arrangements for getting out in the morning. I'm not so sure about this staff of mine, so far.

Colonel Whitestripe: I'm sure glad you dropped in. I'll be seeing you about 2:00 AM.

Curtain

SCENE 3

Time: 4:00 AM. The next morning.

Scene: Headquarters, 59th Infantry in the field. Command cars, 1½-ton trucks and ½-ton trucks are scattered around under trees a short distance from a road. Men are sprawled out all over the place, some sleeping, some working in order to get a conventional command post established. No lights are visible. The night is clear and cold. There is no moon. The scene opens with Lieutenant Colonel Redleg moving cautiously through the area in search of Colonel Whitestripe. He stumbles over something.

Lt. Col. Redleg: ! X ! ?. Now who left a telephone line at a command post on the ground. It better not turn out to be one of my linemen. (He approaches a small group of soldiers.) Can one of you men tell me where I can find Colonel Whitestripe?

Voice of Unknown Doughboy: Yes, sir. The Colonel is in his command car all covered with canvas so his light won't show. Follow me and I'll take you there, sir.

—Here we are, sir.

Lt. Col. Redleg: Hello in there, Colonel; it's Redleg. Got room in there for me?

Colonel Whitestripe: Just a minute until I cover this light. All right, lift up that tarp and crawl in.

Lt. Col. Redleg: Well, I must say, all the comforts of home. These two command cars parked along side each other and covered with one big piece of canvas make a pretty good CP. That gasoline light sure warms this up. Clever idea covering it with blue, too, to reduce visibility from the air. Well, I'm sure glad this is a CPX instead of a field exercise. Moving in at night without advance daylight reconnaissance is a mess. As a matter of fact, all we can do is to get under cover and wait for light. No need of trying to locate batteries at night.

Colonel Whitestripe: It's a good thing for us, too, that it's a CPX. It took my staff two hours to find the battalion command posts. You know, I never have seen the sense of starting these things in the middle of the night, anyway. When there are not troops to move, all the commanders and staffs can do is move in somewhere and sit for hours waiting for something to happen. Most of the time is spent in reminiscing and "chewing the fat". By the way, I think this is a good time for me to get some dope I've been wanting. Executive, have the staff officers in that other car pipe down and listen in on this.

Lt. Col. Redleg: What's on your mind?

Colonel Whitestripe: Well, I've heard talk about a new installation which you call a fire direction center in the artillery. What's it for, and how does it work?

Lt. Col. Redleg: The fire direction center is not new in the sense of directing fire, as the artillery battalion commander has always done that. However, the personnel and methods used now in order to direct fire efficiently are a great improvement over the old methods. Its purpose is to tie the three batteries of the battalion together in order that the data obtained by firing one battery can be

used in firing the others. In addition, it enables the artillery commander to mass the fire of the whole battalion on a target very promptly. By having direct wire communication with the batteries and by always having direct communications with liaison officers and sometimes with battery forward observers, it is possible to mass the fire of the battalion on targets selected by those who can see where it is needed.

Colonel Whitestripe: Doesn't this take a lot of telephone lines and a long time to install them?

Lt. Col. Redleg: Yes, it does, but perhaps not as much as you think. We effect wire communications with the batteries by simplexing the command lines and thereby have direct fire control lines to each battery without having to lay additional wire. This is accomplished very simply with the new switchboard which has a repeating coil permanently installed in it. All the fire control operators have to do is clip onto the command line and stick their ground rod into the ground. As far as communication with the liaison officers and forward observers is concerned, this is done by radio or telephone or a combination of the two, depending on the situation.

Colonel Whitestripe: That sounds like a big establishment. How many men does it take to operate the fire direction center?

Lt. Col. Redleg: Let me see—it varies between six and ten including radio and telephone operators and depends to a great extent on the personnel available. Considering the results obtained using this method, the number of men needed is not excessive. It takes one man, usually the operations sergeant, to run the chart. This chart may be a map or map substitute or it may be just a 1/20,000 grid sheet. It is desirable to have three men to send the fire commands to the batteries, three telephone operators for the battery lines, and one operator, either radio or telephone, to the liaison officer or forward observer.

Colonel Whitestripe: You spoke of the chart being a map or map substitute or just a 1/20,000 grid sheet. Can the artillery occupy a position at night and fire, using any one of these, at daybreak?

Lt. Col. Redleg: Yes and no. If the artillery has a few hours for daylight reconnaissance and survey and has a reasonably good map or photomap, it can occupy positions at night and fire on targets located on the map or photomap at daybreak. However, if no map or photomap is available and it is necessary to fire at daybreak, the artillery would have to be emplaced during daylight the preceding day and each battery "shot in". By "shooting in" I mean that each battery would register on a common base point and their position would be plotted on the 1/20,000 grid sheet using the adjusted data from the registration. This, in effect, is making a map by firing. Observation is necessary for initial location of the batteries and for fire on all new targets. However, fire may be repeated on the targets located on the grid sheet by firing without observation provided the weather conditions have not changed appreciably. A chart made up in this manner is known as an observed fire chart.

Colonel Whitestripe: That sounds pretty good but it occurs to me that you are putting all your eggs in one basket. Suppose a concentration of enemy artillery hits your fire direction center and knocks it out. What do you do then?

Lt. Col. Redleg: The point you have mentioned is an important one. In centralizing the fire control of the battalion in the fire direction center we do not lose sight of the fact that decentralization may become desirable or necessary. Each battery forward observer maintains communication with his battery and each battery is always ready to set up a firing chart. If decentralization becomes necessary, each forward observer becomes something of a liaison officer and each battery becomes

a limited fire direction center. Of course, in this case the fire of the battalion cannot be massed as efficiently or as promptly as with the fire direction center.

Colonel Whitestripe: Well, I'd say that with that set up, you should be prepared for any eventuality.

Lt. Col. Redleg: Yes, I believe that we are. We are trying to avoid rigid rules in order to keep our methods flexible and to fit them to each situation as it arises.

Colonel Whitestripe: Speaking of flexibility, is it possible for you to move your command post every time I move mine? It appears to me, after your explanation of the fire direction center, that you have a fairly large installation and lots of wire to root up when you move your command post.

Lt. Col. Redleg: You are right. No, I can't move my command post every time you move yours, and still give you continuous support.

Colonel Whitestripe: Well, then, how are we going to keep up this command liaison?

Lt. Col. Redleg: The best solution is for me to send my executive with you and to lay a line to your new command post as soon as it is located. Later, when it is necessary to displace my batteries, I will echelon my command post forward just as I do my batteries. I will have my new command post open and operating before I close the old one.

Voice of Regimental Executive: "Colonel, a message from division has just been received saying the enemy is withdrawing; we are to prepare to move. An amended attack order will be sent in about 15 minutes."

Lt. Col. Redleg: "I'd better be getting back to my command post at once."

Curtain

MEMORANDUM FOR LT. COLONEL REDLEG

In discussing the recent CPX with the field and staff officers of the regiment I find that there is some uncertainty or difference of opinion among them as to the meaning of certain terms used in connection with artillery. Would you mind sending me an informal memo giving the latest doctrine or definition, as the case may be, of the following:

Direct Support
General Support
Attached Artillery
The distinction between a barrage and a concentration.

I would also appreciate a brief summary of the various terms used by the artillery when speaking of different types of fire such as schedule fires, supporting fires, neutralization, counterpreparation, etc. I'll use your memo as the basis for a school session.

Whitestripe.

MEMORANDUM FOR COLONEL WHITESTRIPE:

The first three terms you mention, direct support, general support, and attached, are those normally employed in division orders in order to convey a great amount of information to all concerned in a very few words. From the artillery viewpoint they provide the key to his whole method or technique of operation for the action directed. This is particularly true with respect to the system of communications and liaison.

DIRECT SUPPORT.—If the order states: " * * * The 51st Field Artillery Battalion is in direct support of the 59th Infantry" this battalion has the primary mission of providing artillery support for the 59th Infantry. It then automatically establishes the three types of contacts, namely, the commander makes personal contact with you; the liaison officers report to the two forward battalions of the 59th Infantry; and the forward observers from the batteries would operate in the zone of the 59th Infantry. The battalion would however, have a secondary mission of being pre-

pared to deliver fires on division order. In this situation, the 59th Infantry may receive on call additional artillery support to include fires of all of the division artillery.

GENERAL SUPPORT.—When the division order prescribes that a field artillery battalion will be in general support, the battalion is emplaced, and its communication and observation established, so as to be able to fire in support of any part of the division. Artillery with such a mission is a powerful means by which the division commander can influence the action of the division as a whole. The liaison officer's work with artillery headquarters or with other artillery battalions and its forward observation is established so as to cover as much of the division area as possible. In the triangular division, it is more or less customary to place the artillery battalions which normally operate with the two forward regiments in direct support of these regiments and to place the battalion which normally operates with the regiment which is held in division reserve, in general support, together with the medium battalion. When the reserve regiment is committed the mission of this field artillery battalion is changed from general support to direct support.

ATTACHED ARTILLERY.—As you know, as a general principle, we of the artillery normally do not favor the attachment of artillery to infantry regiments. However, the reason for this is generally misunderstood in the service. Actually the reason for the opposition to attachment of artillery to infantry units within the divisions is not based upon the reluctance of the artillery to be placed under the command of the infantry regimental commander but because this attachment lessens the effectiveness of the artillery support. Unless an infantry organization is to operate at such a distance from the remainder of the division that it cannot be supported by the remaining artillery of the division, there is nothing to be gained by attaching artillery to it. On the other hand, much support may be lost.

Attached artillery can be compared to the system of banking in effect *before* the inauguration of the Federal Reserve System. Artillery in direct support can be compared *to* the Federal Reserve System. Before the newer system went into effect, a private bank in a small town was "attached" to the town and had only those outside connections it was able to make by personal arrangements. If there was a "run" on that bank, it could receive no outside assistance and had to rely only on its own supply of available cash. Frequently it went under. Now, through the channels of the Federal Reserve System, it receives ready cash from the other banks to help it through the emergency.

When a battalion of artillery is attached to an infantry regiment, it loses its normal communications hookup with divisional artillery headquarters and its normal liaison connections with artillery battalions in general support. Likewise, there is no normal channel of either command or communication whereby it may expeditiously call for and receive assistance from other attached battalions in the same general area, or battalions in direct support of adjacent units. In other words, the infantry gains nothing but may lose the opportunity of receiving additional artillery fire support. This same direct support artillery may be called upon to lend its support to another direct support artillery unit, in which case it will furnish it, provided its fire at that time is not essential to the infantry unit it is supporting.

BARRAGE AND CONCENTRATION.—The distinction between a concentration and a barrage is largely a matter of the purpose of the fire and the shape of the area in which the fire is placed. Barrages are defensive fires placed immediately in front of an occupied line or position for the purpose of stopping an enemy assault. A concentration is a volume of fire placed on an area within a limited time. Therefore, you might say that a barrage is merely a special form of a concentration. From the standpoint of artillery technique of fire there is a decided difference between the two. Concentrations are normally fired as a series of volleys with a constant deflection setting but each volley at a different range. The resulting area, or beaten zone as you

call it in the infantry, is roughly an ellipse. This area is plotted on operation maps, or fire plans, as a circle. The area is normally considered as 200 yards in diameter for a 105-mm howitzer and as 250 yards for the 155-mm howitzer. If a more dense fire is desired they may be reduced to 100 yards or conversely if a lesser density is required they may be increased to 300 or even 400 yards, in which case a change in deflection setting is made as well as a change in range for each volley.

Barrages are fired as a stationary line of bursting projectiles. A 105-mm howitzer battery can cover a 200-yard barrage line without shifting fire. The maximum line which one 105-mm battery can cover is 300 yards, but if a denser fire is desired, it may be reduced. A barrage is indicated on a map by a rectangle 100 yards deep and 100, 200, or 300 yards in width, depending on the density of fire desired.

The other terms you mention are used in connection with the classification of artillery fires. This chart, I believe, shows them all.

Tactical Classification of Artillery Fires:

Effect Sought	(Destruction (Neutralization
Form	(Concentrations (Barrages
Prearrangements	(Schedule fires (Fires on targets of opportunity
Tactical Purpose	(Supporting fires (Artillery preparation (Counterpreparation (Counterbattery (Interdiction fire (Harassing fire

Destruction fire is fire intended to destroy enemy works or material. It requires a large expenditure of ammunition and is usually handled by medium and heavy artillery under corps or army control.

Neutralization fire is used for destroying the combat efficiency of enemy *personnel*. This effect is usually temporary and the fire must be repeated when again required. This is the normal purpose of the fire of division artillery. In order to effect neutralization, it is better to use artillery in mass (more than one battery) and to deliver the fire in short, rapid bursts.

Schedule fires are fires planned to be delivered according to a time schedule or on call or signal from the supported troops.

Fires on targets of opportunity are fires placed on important targets located subsequent to the prearrangement of the schedule fires.

Supporting fire is a general term applied to artillery fire delivered while the supported troops are engaged in the defense or after they have launched the attack.

An artillery preparation is a prearranged intensive fire delivered on known enemy positions before the launching of an attack.

A counterpreparation is a prearranged fire delivered just prior to an enemy attack with a view to breaking up his formations and disorganizing his attack.

Counterbattery fire is fire delivered for the neutralization or destruction of enemy batteries in position.

Interdiction fire is fire delivered on points or areas which it is desired to prevent the enemy from using.

Harassing fire is fire delivered during a relatively quiet period to interfere with and annoy the enemy.

I hope this is the data you desire.

Redleg.

SCENE 4

Time: October, 1941.

Scene: Somewhere in North Carolina. The 13th Division is now engaged in the Corps Maneuvers which preceded the

First Army Maneuvers. In the exercise now under way, the division, with an offensive mission, has made contact with red covering forces and the leading regiment, the 58th Infantry, has attacked to develop the situation. A messenger from division headquarters delivers an order, consisting of an overlay with a few notes of amplification and authentication thereon, to the headquarters of the 59th Infantry. Shortly thereafter, Lieutenant Colonel Redleg arrives at the 59th headquarters and approaches Colonel Whitestripe who is sitting at a folding table talking to some of his staff.

Colonel Whitestripe: Hello, Redleg, I'm glad to see you. My S-3 has just finished putting this operation overlay on my map. I presume you've gone over your Division Artillery order.

Lt. Col. Redleg: Yes, it arrived a few moments before I started over here. They surely are giving us the works this time. We have priority on call in our zone and the 50th Field Artillery Battalion has been assigned to reinforce our fires. A fifteen minute preparation has been prescribed. We are going to be pretty busy from now until dark, if we complete the necessary preliminary reconnaissances and arrangements that must be made in daylight.

Colonel Whitestripe: I have just been going over the map in order to plan my reconnaissance. From the map it looks like the regiment has a pretty good corridor for its attack. As you see here the boundary between our regiment and the 14th Division on the right follows in general this ridge and the left boundary between us and the 57th Infantry follows this ridge here. I am going to need two battalions in order to cover the front and from the general appearance, I think I will put the boundary generally about here. I don't like it but there doesn't seem to be any terrain boundary that will work. I plan on getting up here on this high ground in rear of the 58th where I should be able to see the major portion of the front. By the way, I presume you had your position areas generally prescribed by division.

Lt. Colonel Redleg: Yes, here they are on my map.

Colonel Whitestripe: Well, that's fine because we can go through that area enroute to this high ground where I have directed my battalion commanders to meet me. That way we can kill two birds with one stone. Well, I think we are ready to start out on this reconnaissance. How about you, are you ready to go?

Lt. Colonel Redleg: Just a minute, I want to send a message back to the battalion Exec. and I will be with you.

* * * * * *

Colonel Whitestripe: Well, here we are. Looks like this place I picked to issue my order is going to be all right. We can see the area in pretty good shape. After looking over the ground, I think I will change that tentative boundary. I will have it run down that ridge, follow the edge of that swampy ground, then over those other wooded areas you see there. By the way, suppose we number these blooming hills on our maps so we can refer to them quickly. We will call this one Number 1, that one over there, that seems to be the key to the enemy's present positions, we will call Number 2, and then just number them consecutively as we go back, like this.

Lt. Colonel Redleg: Now let me check mine to see that I have them all marked the same as you have. Uh-h-oh. Now I have it right. As I understand it you are going to make your main effort with your right battalion.

Colonel Whitestripe: That's right. Now let's see, we are assigning the 3d Battalion in that area. Lieutenant Colonel Doughfoot is a go-getter, as you know, and he will really push that battalion of his through there in the morning. By the way, give him priority on calls for artillery fire. It looks to me as if that hill over there we have marked Number 7 affords a lot of observation for the other fellows' artillery. Don't you think it would be a good idea to put smoke on that?

Lt. Colonel Redleg: Yes, that looks like a good place for some smoke. I will contact artillery headquarters and arrange to have the 52d place smoke on that hill for us.

Colonel Whitestripe: You know our men have done pretty well on night movement, but I think it might be a good idea if we kept some shooting going on during the night in order to keep those fellows from being too comfortable tonight and also help to cover any noise that we make moving into position. Will any of the division artillery be able to fire tonight?

Lt. Colonel Redleg: Yes, the 50th was placed in position to support the action of the 58th Infantry today. Also, we will be registering tonight by means of air bursts so that we can really put down this preparation in the morning. This registration will be coordinated and scattered through the right so as not to indicate the entry of additional artillery. When will you be able to give me the dope as to where you want the preparations placed?

Colonel Whitestripe: I think I will leave that up to the battalion commanders. I will be ready to issue my order in about ten minutes. I see one of the battalion commanders arriving now.

Lt. Colonel Redleg: That's fine. The message I sent just before we started out, directed the liaison officers to report here. They are due in about five minutes. While you are getting ready to issue your order I will meet them and give them their instructions so that they will be able to join their battalion commanders before you issue your order. By the way, which battalion are you placing on the left?

Colonel Whitestripe: The 1st.

Lt. Col. Redleg: Anything else I can do before I take off? We are going to be pretty busy before dark. We can give you effective support this time because we just about have the minimum time it takes to make the necessary surveys and reconnaissances before dark. They cut the

time pretty short though. I will meet you at your command post then in about an hour.

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Lt. Liano: Good afternoon, Colonel Doughfoot. Lt. Liano, reporting as Liaison Officer from the 51st Field Artillery Battalion.

Lt. Col. Doughfoot: Glad to see you again, Lieutenant. I'm just on my way to report to the Old Man for orders. Come along and listen in, it will save time.

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Lt. Col. Doughfoot: My detail is back there (pointing). I want to see a couple of the officers here before I leave. I'll want you to go with me on my reconnaissance in about ten minutes. Meet me back there with the group from my headquarters.

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Lt. Col. Doughfoot: Now that I've got the staff all working and the company commanders on their way, I'm ready to start on my reconnaissance. I want to go first to the headquarters of the battalion of the 58th that is on this front. It is located right down this valley about 800 yards. Our CP is to be about 300 yards from it. After contacting their headquarters I'm going up to that hill from where I should be able to see pretty much all of our zone. Enroute we'll pass right by the location of our CP.

Lt. Liano: I'll have my detail follow along in rear then and have them drop off at the CP location. They can start work there.

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Lt. Col. Doughfoot: We sure have a good view of the front from here. I'm glad they have arranged to smoke that hill. The Reds sure are looking right down our throats from there. The battalion commander mentioned fire from three areas had stopped their advance. Have you been able to identify any of them?

Lt. Liano: Yes, the two on the prominent hill are very evident. They didn't do much of a job of camouflaging

there. The position on that ridge running off to the north is a little harder to pick up. I think they have another position on that little ridge running from the edge of the woods down to the marsh.

Lt. Col. Doughfoot: How many concentrations can you get for the preparation? Just how much does this reinforcing business by the 50th mean?

Lt. Liano: Well, in effect they are in direct support of our battalion. That means that the 59th will have the fire of six batteries in direct support. Since you have priority on calls, I think we can get at least four batteries for the preparation.

Lt. Col. Doughfoot: That's fine, I'd like to have fires placed on that ridge, on that hill, and also on the little ridge just west of the marsh. I'll put the fire of my mortars in the woods over there to help clear the way for my main effort. It looks to me as if that hill there about 500 yards to the rear and off to the north of our first objective affords excellent positions for flanking fires in support of their keypoint. I'd like the fires lifted to that hill and to this one over here when the preparation is ended.

Lt. Liano: I can arrange for these I'm sure; I'll get them on an overlay and send them back to battalion right away. Any change in the signal for lifting fires?

Lt. Col. Doughfoot: No, the green parachute signal or the green Very pistol signal are still calls to lift fire. However, you remember we've had some trouble in seeing them in the past so I want to be sure that the forward observers as well as yourself are familiar with the radio code for lifting fire and that the call is relayed by radio.

Lt. Liano: I think that we've taken care of that now. The artillery fire control code we are using now has a code group assigned to mean "Lift fires."

Lt. Col. Doughfoot: That should take care of it but I'm still skeptical about radios. We never have had much success with them. What other alternate means can be used if neither the light signal or radio work?

Lt. Liano: Normally, of course, either myself or the forward observer can use the telephone. If the lines are out I have signal lamps and, as a last resort, the messenger. Do you have any other areas for which you would like to have fires planned?

Lt. Col. Doughfoot: Yes, I'd like to have fires planned for that wooded ravine in rear of our objective, it looks like a fine assembly area for hostile reserves; also that open ground to the north of the first objective looks like a likely place for a tank attack.

Lt. Liano: If that's all for now, I'll go back to my detail and get the overlay showing the fires you want started back to battalion headquarters.

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Lt Liano: Good morning, Colonel, it won't be long now. I've just checked with battalion and they are all set. All batteries have registered and are ready to start their preparations. Two of our batteries and two from the 50th are putting fires in our area. There is a forward observer in the area of each of your leading companies and they have checked in with the rifle company commanders.

Lt. Col. Doughfoot: I think we are all set for them this time. Last time we were out, we had trouble getting credit for artillery fire with the umpires. We have the same group today and I think they know more about this job now. I think I can see someone moving over there in the enemy lines now. Yes, there it is, he has placed the artillery fire flags on the hill and is moving over north, apparently to mark the concentration on the ridge there.

Lt. Liano: I sure hope we spotted their defensive positions. If we did, there goes 15% of their effective strength, for the umpire manual says we get 1% casualties per minute for all troops within a radius of 100 yards of those flags.

Lt. Col. Doughfoot: The white flags are up now while the umpires figure our fire power. With this fine position for locating supporting weapons we sure have a lot of it, too.

We have all eight heavy machine guns in positions within range of 1000 yards of the Reds and all 60-mm mortars and light machine guns of the battalion are emplaced so as to support the initial attack. At 10 per heavy machine gun, 6 for each 60-mm and light machine gun and 15 for the four 81-mm guns, we have a fire power of 248 from supporting weapons alone. Nothing to do now for a while but wait.

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Lt. Col. Doughfoot: There are those blankity-blank red flags again. Come on, Liano, I'm going back to the Command Post to see what information has come back from the companies.

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Lt. Col. Doughfoot: Oh, Liano, come here. You remember that ridge running north from the objective on which I asked you to prepare fires?

Lt. Liano: Yes, sir, we have three concentrations planned for that area. Here they are on my overlay.

Lt. Col. Doughfoot: Fine, Captain Aco reports that he has been held up by fire from that general area. Says he has located some machine guns and asks for artillery fire.

Lt. Liano: Since Captain Aco has definitely located some machine guns, how about my arranging to have the forward observer in that area contact him and bring the fire of the whole battalion on them?

Lt. Col. Doughfoot: That will be fine; how soon can you get it?

Lt. Liano: If the batteries are not firing elsewhere we should get all three on the target within from five to ten minutes.

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Lt. O'Look: (A forward observer) Captain Aco, I've just received orders to conduct the fire of the battalion on a target which you have reported. Will you point it out to me?

Capt. Aco: I sure will. Come up here. Keep down for these umpires are mean about assessing casualties today. I've lost two lieutenants who exposed themselves. See those two pines on that ridge with what looks like a bush between them?

Lt. O'Look: You mean the two big ones that seem to be leaning towards each other?

Capt. Aco: No, the ones I mean are only about half that far away—out there about 400 yards—they are just to the right of that light colored spot.

Lt. O'Look: Oh, yes. I've got them spotted now.

Capt. Aco: There's a section of machine guns in the bushes about 50 yards to the right of them. While you're getting fire on them I'll get my reserve platoon in motion. How about letting him fire a Very pistol signal when he's ready to go?

Lt. O'Look: That's fine, where will he fire it from so I can watch for it?

Capt. Aco: From that little gully you see just this side of that cotton patch.

Lt. O'Look: O.K., sir, here we go. That's pretty close to the troops. I'll start well over so as to be safe.

Lt. O'Look: Fire mission—concentration 321 is 300 left 200 over of enemy machine guns * * *.

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Lt. Col. Doughfoot: Well, Liano, the artillery produced—it is only seven minutes and already the 3 artillery flags have been placed on that ridge. When a rifle company commander can get the fire of a whole battalion of artillery placed on a target within effective rifle range of his position, in seven minutes, that's what I call close support.

Curtain

SCENE 5

Time: November 25, 1941.

Scene: Army Maneuvers—somewhere in North or South Carolina. In the final exercise the 13th Division is a part of a Corps with a defensive mission. Instructions for the final exercise prescribe that the Corps Defense Order will be released to divisions at 1:00 PM; that reconnaissance parties will be kept to a minimum and will operate so as to maintain secrecy from hostile observation aviation and that all troop movements will be made under cover of darkness. At 2:00 PM a division warning order was sent to all concerned and at 3:00 PM we find Lt. Colonel Redleg arriving at the CP 59th Infantry. He has a copy of the Division Artillery order. Colonel Whitestripe is at a table studying a map.

Colonel Whitestripe: Hello there, Redleg. Well, we're off again. I'll sure be glad when this one is over. I've just gone over the division order and have sent warning orders to my battalions assigning them general areas for reconnaissance. The battalion commanders are to meet me for orders at this crossroads I have marked X at 3:45. Doesn't allow me much time for reconnaissance but the company and platoon commanders are the ones who really need time on the ground.

Lt. Col. Redleg: Which battalions have you assigned to the forward areas? I want to get the Liaison Officers to them at once so they can be with the battalion commanders on their reconnaissance.

Colonel Whitestripe: The 1st Battalion will be on the right and the 3d on the left.

Lt. Col. Redleg: Fine, if you'll excuse me for a minute I'll step out and send a liaison officer to each of them at once.

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Colonel Whitestripe: How about riding with me? We can talk things over on the way—we have about 12 miles to go.

Lt. Col. Redleg: I'll be glad to—it will reduce by one the number of vehicles in the area and give me an opportunity to give you what information I have.

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Colonel Whitestripe: Where is your battalion to go into position?

Lt. Col. Redleg: We have been assigned the area shown here. I have my survey party out now and also the battery reconnaissance details. One battery will be placed well forward just in rear of the regimental reserve line so it can reach well out. The other two will be echeloned to the rear with the rear battery about 4000 yards back of the main line of resistance. That way two batteries can fire in support of the outpost and two in support of the regimental reserve area and all three in support of the main line of resistance.

Colonel Whitestripe: They have finally given us a reasonable sector this time. For once I believe we can take up a real coordinated defense. As I remember this area, it is rolling and a lot of it is under cultivation so we should be able to get some good fields of fire for our infantry weapons. From the stream lines shown on this maneuver map, the left area is less broken than the right. I'm going to take a look at this area, which from the map seems to be the key point of the sector and then take a quick look at the forward areas by driving across the front along this road. How many barrages from the light battalion in general support do we get?

Lt. Col. Redleg: The 49th is to be out in front in support of the division outpost. When it comes back it goes into position generally in rear of the boundary between regiments. The normal barrage of one of its batteries is allotted to the 59th Infantry.

Colonel Whitestripe: Stop here a minute, driver. Now, this corridor here forms an avenue of approach to either of the battalion areas. I believe it is a more serious threat to the 1st Battalion on the right than to the 3d

on the left. To assign it to the right battalion, though, gives it a wider frontage than I'd like. However, I think I'll do that and then favor them in the allotment of normal barrages.

Lt. Colonel Redleg: I'll allot the fires of two of my own batteries to them. We can be sure of getting them. Also I'll ask for an emergency barrage for that area too. How about the areas on which you want counterpreparation fires placed?

Colonel Whitestripe: I haven't even thought of them yet. Here we are at crossroads X. Major, have the officers assembled in the edge of the woods up there on the hill. You orient them on the ground while I finish my notes for the order. When I've finished that, Redleg, we'll go over the rest of the artillery fires.

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Lt. Col. Doughfoot: Well, Liano, you've seen the whole of our battalion front and have heard some of the discussion about the locations of the machine guns. It will be some time before I can get the overlays showing the exact position areas and directions of the final protective lines. However, there are at least three areas that I know can't be covered by machine-gun fire. This wooded stream bed in the left of the battalion area is the worst. There will be a section of guns on that nose there. How about putting one of the normal barrages to hit in that gully about 200 yards in front of them?

Lt. Liano: I'm sorry, sir, we can't fire there, it is too close to our machine guns.

Lt. Col. Doughfoot: Why not? At all the schools and the extension courses they put the normal barrages 200 yards in front of the infantry.

Lt. Liano: That's right, but that is just an arbitrary figure. The actual safe distance depends primarily on the type of ammunition being fired and the range. With the shell we are supposed to be firing and at this range the closest we can safely place the concentration is about a hundred yards farther out.

Lt. Col. Doughfoot: Well, that sounds reasonable. Now the other one; I'd like to have it placed to block that approach on the right. The forward edge of the woods about 200 yards out in front would be ideal but it's too close, so I suppose we'll have to put it back in the woods.

Lt. Liano: No, sir, I've just been checking up and by using A Battery for that fire we can place it that close because Battery A is up close and over to the left so it will be firing obliquely to the troops and it is safe to fire closer with that direction of fire.

Lt. Col. Doughfoot: You know, Liano, you're sure a handy fellow to have around.

Lt. Liano: Thank you, sir. Now, while we're waiting for the plan of fires of your weapons to come in, can you give me some ideas as to where you'd like other artillery fires planned.

Lt. Col. Doughfoot: I've got to get out and check up with the 3d Battalion. Suppose you look over the ground some more and locate the covered routes of approach out in front as well as possible forming up places which we may have missed and I'll go over them with you when I get back. Then we'll ask that concentrations be planned for all of them.

Curtain

SCENE 6

Time: 3:00 AM, November 26, 1941.

Scene: Headquarters 59th Infantry—in the field—Colonel Whitestripe and Lt. Colonel Redleg have just entered the lightproof command post tent.

Colonel Whitestripe: Well, how did things go, Redleg?

Lt. Col. Redleg: Fine for a change. All the batteries got into their positions with very little delay. Our fire direction center is all wired in. The normal barrages and emergency barrages have all been figured and they are about finished with the defensive concentrations cover-

ing avenues of approach to the main line of resistance and the third priority fires which cover other concentrations beyond the main line of resistance. They are working in shifts and will be able to have the counterpreparations all figured by five o'clock. Do you have the plan for fires you desire for limiting hostile penetrations or envelopments and for supporting possible counterattacks?

Colonel Whitestripe: I can give you the first but the counterattack plans can go over until after daylight. You see here on this situation map the areas where the battalions have planned to employ their reserve companies to limit penetrations? I'd like fires planned to support each of them. Also the reserve battalion is prepared to occupy one or all of these positions in the rear of the area to protect the regimental key point or to act as a covering force if we are ordered to retire. I'd like fires planned in the approaches to those positions, no big rush though.

Lt. Col. Redleg: I'll send an officer over to make an overlay of those positions and we will have them ready for you.

Colonel Whitestripe: Well, I think I'm going to try to get a couple of hours sleep. I expect they will be attacking the outpost about daylight.

Lt. Col. Redleg: I think I'll do the same. I'll be back about six.

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Time. 6:30 AM, same day.
Place: Same.

Colonel Whitestripe: How about a cup of coffee, Redleg? My S-4 just got back with a refill on these thermos bottles.

Lt. Col. Redleg: I can sure use it. Mine was stone cold.

Colonel Whitestripe: There you are—no cream and sugar but it sure is hot and plenty strong. While you're finishing that I'll look over these revised counterattack plans. They seem to be satisfactory now. S-3, give copies of each plan to Colonel Redleg and send copies of each to

division. Send the 58th a copy of Plans A and B and send the 14th Division a copy of Plan C.

Lt. Col. Redleg: I'll take these over to the Fire Direction Center so they can plot the artillery fires and figure them. We will also send Division artillery headquarters the information. Then we may be able to get more help if we need it.

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Colonel Whitestripe: I've just been looking at an intelligence summary which just came in. Looks as if we may have some chutist visitors somewhere today. A large number of transport ships reported on one of the enemy airdromes.

Lt. Col. Redleg: I'm not so much worried about parachutists but we aren't any too well fixed for antitank defense.

Colonel Whitestripe: I feel the same way. With the regimental headquarters and the reserve battalion in this general area we are pretty well cared for against parachute attacks, particularly here. All of the automatic weapons of the reserve battalion are set for antiaircraft fire and for all around defense of this area. We are short on antitank guns, though. By the way, did my antitank officer get in touch with your battalion with reference to coordinating the defense of his company with your guns?

Lt. Col. Redleg: Yes. He has placed the platoon of his company, which is covering your rear area, so that it affords pretty good protection to the batteries from the front. We have used our six guns to watch the flanks and rear. By the way, one section is sure in a fine place to stop any attempt to attack this headquarters from the rear, too.

Colonel Whitestripe: I've been intending to ask you about ammunition supply. With all these fires you plan it must take a lot of ammunition. What expenditure do you figure for a defense?

Lt. Col. Redleg: They call the unit of measure now a unit of fire instead of a day of fire, which was ambiguous. The

unit for the 105 Howitzer is 225 rounds and for the 155 Howitzer 150 rounds per howitzer. For a light battalion a unit of fire weighs 68 tons and for the medium 95 tons. For the first day of attack or defense of a position we figure on two units of fire and one unit for each succeeding day.

Colonel Whitestripe: How much of this can you carry on your organic transportation?

Lt. Col. Redleg: The light battalions carry one unit of fire. Each firing battery carries 400 rounds or a total of 1,200 for the three batteries, and the battalion ammunition battery carries 1,500 rounds. All of the vehicles available for resupply can haul ¾ of a unit, so, you see, in order to get enough ammunition at the guns for the defense today all vehicles had to make two trips and a part of them three. The mediums are worse off. They carry 4/5 of a unit on their organic transportation and available transportation for resupply can carry only ½ a unit, so they have to make three trips with all their transportation and a fourth trip with part of it.

Colonel Whitestripe: Are you playing the ammunition supply on these maneuvers?

Lt. Col. Redleg: I'll say we are. We have cordwood and boxes loaded with sand. The trucks not only have to make the trips but details are required to unload one half the load at each end and reload it so that makes the same handling as under actual conditions.

Colonel Whitestripe: I see now why the artillery object to this promiscuous use of artillery trucks for shuttling and other motor movements.

Lt. Col. Redleg: Yes, on maneuvers it's easy enough to let ammunition supply be simulated and leave kitchens in the front lines so that trucks can be used for these wide end runs, the brass hats figure out, but in action it sure won't work. My fire direction center has sure come to life, something must be happening.

Colonel Whitestripe: I knew this lull was too good to last; we'd better be getting up to my OP.

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Curtain

EPILOGUE

The maneuvers are over, the troops back in their cantonments, furloughs and leaves of absence have been granted liberally. We find Colonel (temporary, just received) and Mrs. Redleg calling on their old friends, the Whitestripes. The ladies are exchanging the latest gossip over their knitting and the Colonels are batting 'em out over their tall ones.

Colonel Redleg: What do you know about this rumored reorganization of the infantry regiments?

Colonel Whitestripe: I've heard a lot about it. No one seems to know exactly what to expect. It is generally expected that the battalions will get some 37-mm antitank guns and the regiment an additional company of either 75-mm guns or 75-mm howitzers.

Colonel Redleg: I'm sure glad to hear that. I so thoroughly believe in the power of artillery fire that the more people that have them the better it suits me.

Colonel Whitestripe: Well, I'm not so sure. Just because the Germans have put artillery weapons in their infantry regiments, is no reason we have to do it. I'm inclined to think that, with the liaison and cooperation that we have worked out, the infantry will get more and better support if they leave the guns in the artillery. Put an extra battery in each battalion if necessary.

Colonel Redleg: It's true we did have fine results on these maneuvers. However, we had no enemy fire to be cutting wires, killing liaison officers, linemen, etc. I think you'll find that that battery or company in your regiment will come in mighty handy.

Colonel Whitestripe: Well, maybe so, but won't it give the artillery an excuse to go back to the old World War I system of never getting anyone within a mile of the front?

Colonel Redleg: Never. Now that we have found a system that really enables us to give the infantry effective close support and are getting the technical signal equipment to make it work, you can bet the artillery will never go backwards.

Curtain

CHAPTER 9

Rifle Company Platoons in Attack

WHAT HAS GONE BEFORE

After some months in a training area, the 24th Division, including the 99th Infantry, was transferred to the Theater of Operations. Following rumors relative to a big scale offensive, the regiment made two long night movements by motor transport. During daylight hours concealed bivouacs were occupied with stringent precautions taken to avoid hostile air observation.

At about 3:00 o'clock this morning, the 3d Battalion detrucked in a wooded area. After some delay and considerable confusion, the kitchen and baggage trucks arrived, and the men received a breakfast of sorts. Each man was issued two sandwiches.

At daylight, (5:30 AM) the battalion was formed with Company I as the leading company, and started marching as the rear battalion of the regiment. The route of march was over a poor dirt road which led generally to the northeast.

The troops, in a column of files on each side of the road, shuffled along in thick red dust. After about two hours of marching faint sounds of firing were heard far to the front. At about 8:00 AM these were augmented by the distant rumble of intermittent artillery fire. Thereafter the march was interrupted by frequent halts, during one of which the weapon carriers of the 1st Battalion passed the column. These were followed a few minutes later by a battery of 105-mm howitzers. Shortly thereafter a messenger arrived from the front and the battalion left the

road and moved across country, east of the road, to a wooded area where the companies were dispersed and halted.

WHAT HAPPENS IN A REGIMENTAL ASSEMBLY AREA

As Company I was halted, the platoon leaders were assembled and Captain Company I gave them the following information and instructions:

"The 1st Battalion, which was the advance guard this morning, seems to have run into something. We are to halt here, drop rolls, and issue extra ammunition. I am to report to the battalion commander. Lieutenant Second-in-Command, arrange to meet our ammunition truck and the weapon carriers at the point where we entered the woods, guide them to the company area, and arrange the distribution of ammunition by rifle platoons. Issue four bandoleers of rifle ammunition to each rifleman and 50 grenades to each platoon. Lieutenant Weapons Platoon, disperse your carriers against air attacks. Pending further orders, weapons will remain on the carriers. Platoon leaders take charge of your platoons. Be prepared to move out quickly or to join me for orders."

LIEUTENANT 1ST PLATOON

What would be the actions taken and the orders as actually issued by Lieutenant 1st Platoon with respect to—

1. Dropping individual rolls?
2. Issuance of extra ammunition?
3. Formation to be adopted by the platoon after these operations are completed?
4. Antiaircraft security?

DISCUSSION

The route march preceding an attack will normally end in a regimental or battalion assembly position (area), where individual rolls are dropped, extra ammunition is issued, and plans are completed for the continuation of the advance.

Since, in the usual case, commanders will be forward to receive orders or making their reconnaissances, the activities in the assembly position must be supervised by subordinate commanders—frequently entirely by the noncommissioned officers.

Even such a simple operation as the dropping of rolls requires special training and supervision. Unless the rolls have been properly made they cannot be separated quickly from the haversacks. Rolls must be stacked by platoons in a location where they can be reached by trucks when the time comes for them to be picked up and brought forward. Also, plans must be made in advance for separating and identifying rolls in the dark. For example, in each squad a light rope may be carried for tying together the rolls of the squad; with one knot, two knots, etc., designating the squad within the platoon. When loaded in truck or trailer, platoon piles should be separated by pieces of salvaged canvas, or some other expedient. Within squads some system of identification of individual rolls by sense of touch should be improvised.

It is desirable that the location of the platoon piles be such that one man from the company can act as guard for all. Battalion headquarters should be notified as to the location.

The issuance of extra ammunition to the rifle platoons may be handled in several ways. Whenever the terrain permits, the company ammunition truck is released to the company at some designated point where it must be met by a guide. He leads it to the company area. Here, in order to avoid congestion, it is advisable for the truck to move to platoon areas in turn, and drop off the extra ammunition for one platoon in each. The ammunition is then issued under the supervision of the platoon leader or the platoon sergeant. Where this method is impracticable the truck may be spotted under cover and the ammunition unloaded and divided into platoon piles. Each platoon then sends a carrying party to get its ammunition, carry it to the platoon area, and distribute it to the platoon. Another plan is to divide the ammunition into four piles, one of which is automatic

rifle ammunition. The platoons are then brought to the area in turn, one squad filing past each pile.

Whatever system is used should provide for the expeditious issue of the ammunition, without confusion and without bunching the men.

The amount of ammunition to be issued to each rifleman is a command decision, normally made by the battalion commander. Since frequently it is impracticable to replenish rifle ammunition for front-line units during daylight, one solution is to direct the distribution of four bandoleers (192 rounds) to each rifleman in the companies of the attacking echelon and two (96 rounds) to those of the reserve company. This leaves a small reserve.

The normal load of the ammunition truck includes a supply of hand grenades (150) and also pyrotechnic signals. There is no prescribed allowance of these items to individuals as is the case with rifle and automatic rifle ammunition. By allotting 50 grenades to each platoon, the company commander, in this situation, gives each of his platoons the means for organizing a small assault unit.

The 60-mm mortar and light machine-gun ammunition presents a different problem. If it is decided to move these weapons by hand when advancing from the assembly position, approximately one-half the normal load of each weapon carrier will be carried by the members of the crews. A corresponding amount of ammunition may then be transferred from the ammunition train truck to the weapon carriers. This will leave a partial load on the ammunition train truck of each of the rifle companies which may be consolidated under battalion control at the battalion ammunition distributing point.

In a situation such as is presented here, where the terrain and the tactical situation permit the weapon carriers to advance with the company in front of the regimental or battalion assembly position, the weapons and ammunition are left on the carriers to conserve the strength of the men. The manner of release of ammunition train trucks to companies and their return to battalion control is properly in-

cluded in regimental standing operating procedure. In the usual situation, as soon as extra ammunition has been issued, the ammunition truck is returned to the point where it was released to the company. It then reverts to battalion control. Trained troops can accomplish these operations in about thirty minutes during daylight or forty minutes during darkness.

While halted in an assembly position, troops may be particularly vulnerable to attacks by aircraft and mechanized units. Therefore, all commanders seek by all possible means to reduce these hazards. Within the platoon men must be required to keep under cover. Unless other specific arrangements for their employment have been prescribed by a higher commander, whenever the terrain permits the automatic rifles of the platoon are posted so as to be able to fire on low flying aircraft under control of their squad leader. Likewise lookouts are posted to relay antitank, antiaircraft or antigas warnings from the warning system. In addition, the platoon may be required by standing operating procedure to provide lookouts who operate in the warning system established by higher headquarters.

In addition to keeping the platoon spread out so as to avoid congestion, the platoons within the company and the squads within the platoon are disposed as nearly as possible in the relative position they will occupy in the formation when the company leaves the assembly position. Men should be kept in their organic groups.

Orders issued in an assembly position will vary greatly in contents and scope, depending primarily on the proximity to, and the information available of, the enemy. In an indefinite situation such as this, orders to small units may consist merely of a direction of advance, their position in the formation, and instructions relative to ammunition and the control of motors.

THE SOLUTION OF LIEUTENANT 1ST PLATOON

The actions and orders of Lieutenant 1st Platoon:

Before returning to his platoon he consults Lieutenant Second-in-Command as to the method of distribution of ammunition and the general area in which rolls are to be stacked. He is informed that the truck will bring his ammunition to a point near the platoon and dump it, and an area accessible to trucks is pointed out near which rolls are to be stacked.

Upon reaching his platoon he assembles his squad leaders, platoon sergeant, and platoon guide, and issues the following instructions:

"We don't know much about the situation except that the 1st Battalion has run into something.

"We are to drop rolls and issue extra ammunition here.

"2d Squad, in that area there (pointing); 1st Squad there (pointing to the southwest of 2d Squad); 3d Squad there (pointing to the right rear of area of 2d Squad); and automatic rifle squad and platoon headquarters here.

"Sergeant Automatic Rifle Squad, have the two automatic riflemen drop their rolls at once and post them in edge of the woods there (pointing to edge of woods about 100 yards distant), for antiaircraft defense. You remain with them and direct their fire in case of attack. Have your second-in-command supervise the dropping of rolls and issuing of extra ammunition.

"Brown (one of the scouts), go up on that little ridge there (pointing to a small ridge about 100 yards away) and act as antiaircraft lookout. Use your squad leader's field glasses. Listen particularly for alarm signals from the warning system.

"Squad leaders, have your men drop their rolls, tie them securely in squad bundles, and stack the bundles there (pointing out the location designated by the second-in-command).

"Keep your men together in the areas designated. Watch the platoon sergeant for his signal that he is ready to issue

extra ammunition and take your squads in numerical order; get the ammunition and return to the areas assigned.

"Platoon Sergeant, take two of the basics of platoon headquarters and when the ammunition truck arrives, put the automatic rifle ammunition in one pile and the rifle ammunition in another, separated by from 25 to 50 yards. Get it opened up. Then have the squad leaders bring their squads up successively. Give each rifleman four bandoleers and make normal distribution to the men in the automatic rifle squad.

"I will be in the platoon area checking on the condition of the men and their equipment.

"Any questions? Move out."

THE APPROACH MARCH

Following the halt in the regimental assembly position where rolls were dropped and extra ammunition issued, the 3d Battalion advanced across country on a broad front. Company I, as base company, advanced to the east of and generally parallel to the road on which the regiment had been marching. Weapon carriers followed the battalion. During advance of approximately three miles, some artillery fire fell in the battalion zone of advance and during the last mile it was necessary to avoid all open, high ground as these areas were covered by long-range machine-gun fires. Shortly after 11:00 AM the battalion was halted under cover of woods and brush behind a ridge. For location of companies I and K, see Figure 51. Company L was in rear of Company K and Company M in rear of Company I. The 2d Battalion 99th Infantry was generally abreast of the 3d Battalion on the left and a battalion of the 98th Infantry on the right.

THE WEAPONS PLATOON

Shortly after Company I arrived in the final assembly position indicated, (See Figure 51) Captain Company I accompanied by the 1st Sergeant, the communication sergeant, and two messengers and Lieutenant Weapons Platoon, accompanied by one messenger, moved to the vicinity of Hill

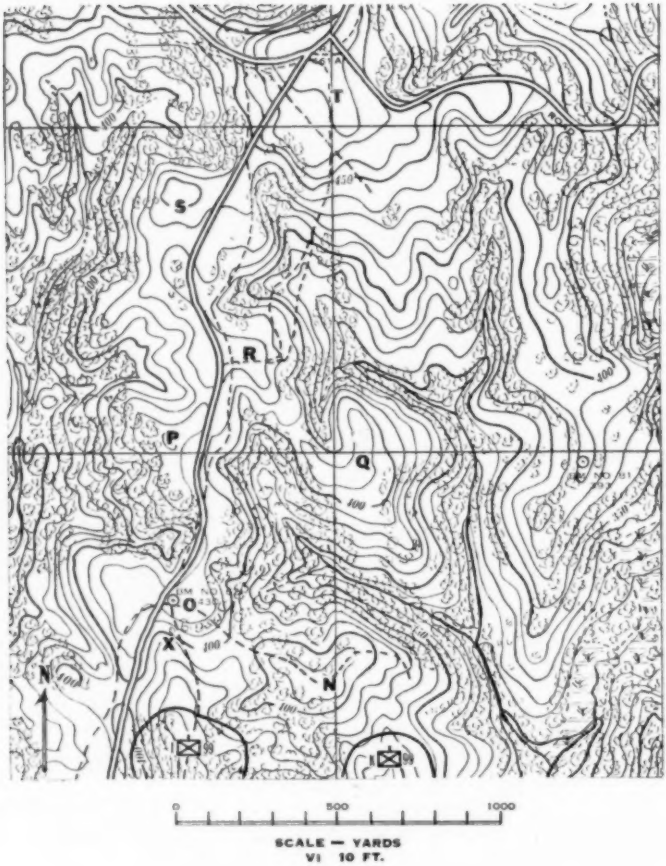

FIGURE 51.

N where Captain Company I directed the men to wait in a concealed position while he and the Lieutenant reported to the battalion commander on Hill N for orders. Upon arrival on the hill they observed that the woods to the north thereof were generally second growth pines from 20 to 40 feet in height with considerable underbrush. Only the eastern slope of Hill Q could be seen.

Lieutenant Colonel 3d Battalion handed each company commander a sketch (Figure 52) and, after orienting the group, issued an attack order which was completed at 11:15 AM.

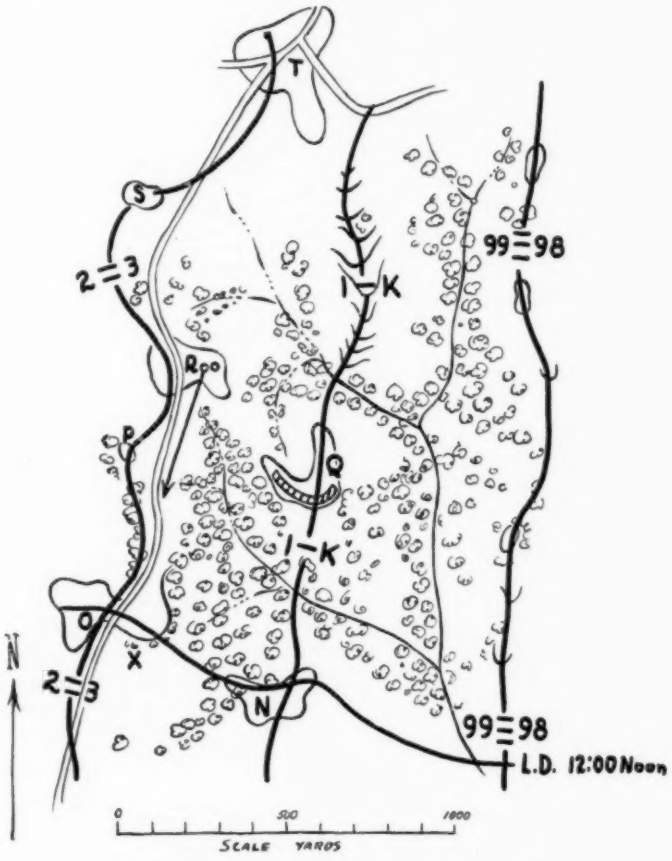

FIGURE 52.—Operations Sketch 3d Battalion.

At the conclusion of the battalion order, Captain Company I gave Lieutenant Weapons Platoon certain essential details of his attack plan and said, "Find a position area or

areas from which the weapons of your platoon can support the attack of the company. Report to me there (indicating point X on the operations sketch) at 11:30 with your recommendations."

Lieutenant Weapons Platoon now has the following information:

Except for small reconnaissance patrols, which have been able to work their way forward, the 1st Battalion operating on a broad front, has been stopped by increasing enemy resistance generally along the high ground through hills N and O.

Men exposing themselves on these hills have drawn machine-gun fire. On the left this fire has been identified as coming from Ridge R. Patrols to the north of Hill N report that Hill Q is occupied but that they have been unable to determine any details.

The 3d Battalion is to attack in conjunction with troops on its right and left at 12:00 noon.

Boundaries are as shown on the operation sketch (Figure 52).

Line of Departure: Trail across hills N and O.

Company I with its left on the high ground along the battalion left boundary is to capture Hill Q and Ridge R, and be prepared to push on to the Battalion objective, Hill T.

Company I is to attack with the 1st and 2d Platoons from left to right in its attacking echelon. Platoons are released to platoon leaders in present areas.

One machine-gun platoon of Company M, from initial positions on Hill O, is to support the attack of Company I.

LIEUTENANT WEAPONS PLATOON

What would be the actions taken and the orders issued by Lieutenant Weapons Platoon from 11:15 to 11:30 AM, and what are his recommendations for the employment of the weapons platoon in the initial phase of the attack?

DISCUSSION

There being little or no information of the enemy available and the terrain permitting a further advance without

supporting fires, only partial attack orders were issued in the regimental assembly area. The battalion has now moved up behind the last mask or cover affording protection from small-arms fire and has occupied its final assembly position. While the troops are in this position final preparations are made for combat, reconnaissances are completed, orders are issued to include all echelons within the battalion, and supporting fires are organized.

When an officer goes to report for orders he should certainly take some of his assistants with him. Field Manual 7-5 states that each unit above the platoon should be represented by two leaders or staff officers. In the usual case, when a commander is absent from his command, the second-in-command remains at the command post. The personnel taken by any commander is a matter of his personal choice but is largely of two categories, those who are to assist him with technical advice and those to be used for communication. In certain situations provision must also be made for the security of the commander while on reconnaissance. The number of individuals assembled in a group to receive orders should be kept to a minimum. The remaining members of the groups accompanying the various commanders should remain under cover nearby so as to be available immediately upon completion of the order.

Having received instructions to be at Point X (Figure 52) to hear the company attack order at 11:30 AM with recommendations as to the employment of the weapons platoon, Lieutenant Weapons Platoon must make a quick estimate of the situation. He knows the hour of attack and a brief estimate of time and space indicates that no time is to be lost if the platoon is to get its weapons off carriers, move to its position for the attack and provide time for issuance of orders to the section leaders. He, therefore, immediately sends the messenger back to the platoon with instructions relative thereto.

The employment of the weapons platoon depends primarily upon whether or not the terrain permits these weapons to be emplaced to support the initial attack of the company.

Lieutenant Weapons Platoon was directed to make a reconnaissance with this in view. He has already seen that the woods north of Hill N preclude the use of that high ground as a position area for either of the sections. He can also see that it is improbable that suitable positions will be found along the ridge leading to Hill O. From Hill O he sees that it affords observation over but a small portion of the area between the line of departure and the initial company objective (Hill Q and Ridge R), is wooded, thereby making support by these weapons difficult. Since no suitable positions can be found on or in rear of the line of departure and since the only part of the company zone of action offering an opportunity for effective employment of the weapons is on the left, Lieutenant Weapons Platoon recommends that the bulk of the platoon be placed in rear of the left platoon.

THE SOLUTION OF LIEUTENANT WEAPONS PLATOON

Lieutenant Weapons Platoon calls his messenger to follow and moves to the western edge of the woods on Hill N. Here he sits down and writes the following message to his platoon sergeant:

THESE SPACES FOR MESSAGE CENTER ONLY

TIME FILED | MSG CEN NO | HOW SENT

MESSAGE

(SUBMIT TO MESSAGE CENTER IN DUPLICATE)

No 1 DATE 23 Oct 41

To Plat Sgt Weapons Plat Co E 99th Inf

This msge will guide sec leaders to me. Have plat go off carriers at once. Leave carriers present location. Move plat forward 300 yds up valley leading north from present location

CO Weapons Plat Co E 99th Inf 11-18 A

SIGNATURE AND ORGANIZATION OF SENDER TIME SIGNED

A B Conrad 2d Lt.

SIGNATURE AND GRADE OF WRITER

He then points out the clump of trees on the southern slope of Hill O (Point X) to the messenger, hands him the message and says:

"Take this message back to the platoon sergeant. You are to guide the section leaders to that clump of trees. Do you understand? Repeat it to me. O. K. Take off and don't lose any time."

He then walked west along the southern edge of the ridge to Hill O where he worked his way up to the crest at several points in a futile attempt to locate observation or firing positions for his weapons. Seeing the company commander approaching the end of the line of trees he hurried thereto, and joining him said:

"Sir, I've been all along this ridge and there just isn't a position from which we can support the attack. I recommend that we give the right platoon one squad of 60-mm mortars and have the remainder of the platoon follow the left platoon. We may be able to find some good positions on the high ground to the left as we go forward."

THE 1st PLATOON:

After directing Lieutenant Weapons Platoon to meet him at Point X at 11:30, Captain Company I gave the battalion operation sketch (Figure 52) to the communication sergeant and directed him to make four copies of the company zone of attack and join him at Point X with them at 11:30. He then pointed out Point X on the ground to one of the messengers and directed him to return to the company and guide the rifle platoon leaders to that point.

He then proceeded on his reconnaissance, accompanied by the 1st Sergeant and the remaining messenger. He met Lieutenant Weapons Platoon and the communication sergeant at Point X at 11:30. After receiving the report of Lieutenant Weapons Platoon he placed certain additional data on one of the operation sketches and directed the communication sergeant to add them to the other copies. (See Figure 53). He then completed his notes for his attack order. At 11:35 the platoon leaders were assembled under

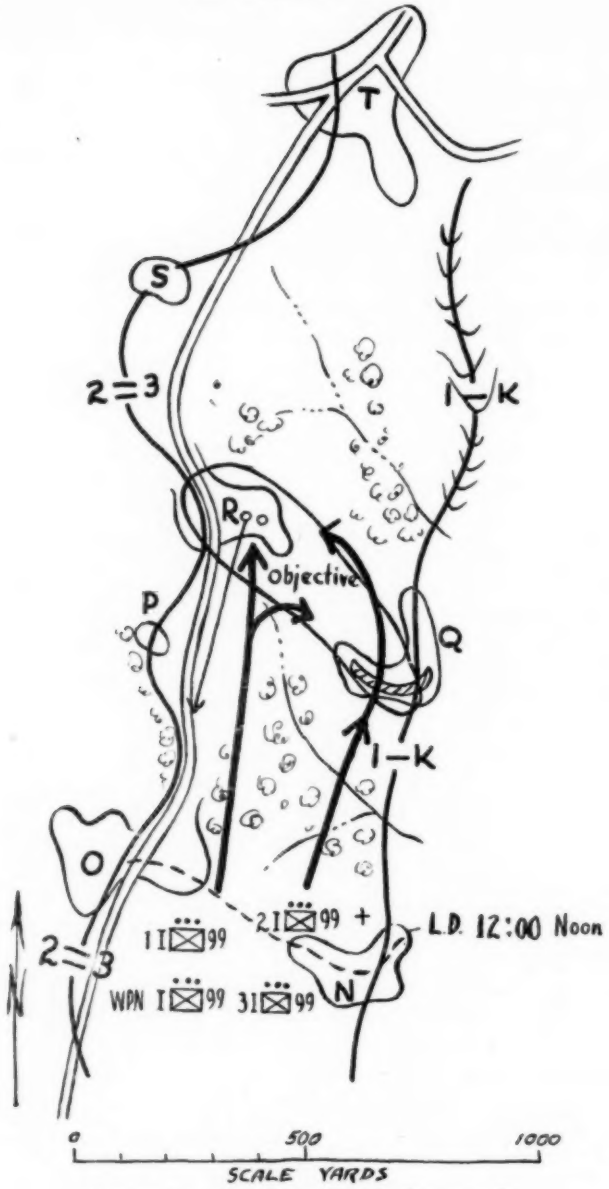

FIGURE 53.—Operations Sketch Company I.

cover, a copy of the operation sketch prepared by the communication sergeant handed to each, and the situation was explained. The group then moved up the slope until the ground over which the attack was to be made could be seen. Upon arriving at the crest they observed the terrain to be as indicated on Figure 51 (Map).

After orienting the officers on the ground, Captain Company I issued the following order:

"This company attacks at 12:00 noon, captures the high ground Q-R and prepares to continue the attack on hill "T" which is the battalion objective.

"Line of departure: This ridge now held by the 1st Battalion.

"Left boundary: The crest of that ridge (pointing) generally paralleling the road.

"Right boundary: Crest of Hills N and Q and the ridge running south from Hill T. See your sketch.

"1st and 2d Platoons in attacking echelon, 1st, base platoon, on the left.

"Initial objective: High ground Q-R.

"The 1st Platoon, supported by the weapons platoon (less one 60-mm mortar squad), moving under cover along the western edge of the woods, will push to the south slope of Hill R and be prepared to assist the 2d Platoon, by flanking fire, to capture Hill Q.

"The 2d Platoon, with one 60-mm mortar squad attached, advancing on the right of the 1st in the direction of hill Q will capture that hill and push rapidly down the wooded ravine north thereof and assist the 1st in the capture of high ground at R by flanking action from the east.

"The 3d Platoon will follow the 2d by bounds at approximately 200 yards. It will maintain contact with Company K on the right and the 2d Battalion on the left.

"The weapons platoon, less one 60-mm mortar squad, will support the 1st platoon.

"I will be in the rear of the 1st Platoon. Any questions? Move out."

LIEUTENANT 1st PLATOON:

What actions should be taken and what orders should be issued by Lieutenant 1st Platoon upon receipt of orders to join the company commander for orders, prior to leaving his platoon?

What are the actions taken and the orders as actually issued by Lieutenant 1st Platoon from the time the company attack order is completed until his platoon crosses the line of departure?

DISCUSSION

The halt in the final assembly position is as short as possible. In this situation only a partial or preliminary attack order could be issued prior to the approach march. Therefore, the halt must be long enough to permit the issuance of the battalion and subordinate attack orders. It may extend from thirty minutes to an hour. The weapon carriers have been able to accompany their units during the approach. Off-carrier positions are now selected and weapons, together with the normal loads of ammunition, are removed from the carriers. Every opportunity is taken to afford the men the maximum rest. The company commander, after studying the ground from the sketch and during his reconnaissance, decides upon a detailed scheme of maneuver which he incorporates in his instructions to the platoons. This scheme of maneuver, a shouldering attack in which first one platoon and then the other acts to assist the adjoining platoon, should be worked out only as far to the front as the ground can be seen. Even then the unexpected may force a change in this detailed scheme of maneuver.

If it were possible, the company commander would like to place all of the supporting weapons in action to assist, first the capture of Hill Q, and second, the capture of the high ground at R. However, from the line of departure it is impossible to determine any location from which this fire can be placed. It appears that as the company advances, firing positions may be located on the high ground along the left

of the position. Therefore, the weapons platoon (less one 60-mm mortar squad) is placed at the left of the company formation with a mission of supporting the left platoon.

Whenever platoon leaders leave their organizations, they should always ensure that whoever is to be in charge during their absence is informed that he is in charge of the platoon and the general whereabouts of the commander. It is normal to leave the second-in-command in this capacity.

The company attack order was completed at about 11:40. This means that the leading platoons must cross the line of departure in twenty minutes. In order to do this they must start moving toward the line of departure promptly. Therefore, the platoon leader must not only take steps to get his platoon in motion promptly but he must get his squad leaders forward, ahead of the platoon, so that he can issue his orders to them. Runners and individuals or small groups can move across country at a much greater speed than the 1½ miles per hour which is arbitrarily assumed for troops moving across the country. Since the platoon area includes the wooded valley leading toward the high ground at R, the platoon leader should decide to take advantage of the cover offered by this corridor and advance in a formation similar to that used in an approach march, prescribing that intervals and distances be reduced so that contact will be maintained in the woods. To prescribe that a patrol move in the open along the ridge in order to maintain contact with the unit on the left would result in these men quickly becoming casualties. Therefore, the Lieutenant directs his left squad to send its scouts up to the high ground from time to time; that is, whenever a small gully or other cover offers an opportunity for them to work their men up to the ridge. During the advance of the platoon through the woods, the men are in little danger from hostile small-arms fire. However, hostile patrols or local security details may be encountered in the woods; therefore, the platoon should be preceded by scouts acting as a patrol.

THE SOLUTION OF LIEUTENANT 1st PLATOON

Lieutenant 1st Platoon, upon receipt of the order that he was to follow the messenger who would guide him to the company commander for orders, turned to his platoon sergeant who had heard the order and said, "Take charge of the platoon and be prepared to lead it forward when I send word." He then calls to messenger No. 2, "Come with me," and leaves to report to the company commander.

Upon completion of the company order, he crawls back of the ridge and calls his messenger to him and says, "Go back to the platoon, tell the platoon sergeant to bring the platoon forward up this valley. You bring the squad leaders to me here. Do you understand? Repeat it. Correct—now hurry."

He then moves east along the south slope of the ridge observing to the front in an effort to find a point where he can see the hostile position. Failing to locate such a point he returns to the place where he is to meet his squad leaders and makes notes for his order.

Upon the arrival of the squad leaders he assembles them, and the party crawls up to the top of the ridge where they can see to the front. He then issues the following order:

"Our advanced guard has been stopped along this ridge by hostile troops to the front. There are some machine guns on that high ground there (pointing toward R). There is a hill in that general direction (pointing toward Q) which you can't see for the trees, and which our patrols report is occupied. We are to attack at 12:00 o'clock, be prepared to assist the 2d Platoon on our right by fire to capture that hill (pointing toward Q) and then we are to get that high ground there (pointing to R). Formation: Second squad forward, automatic rifle squad in the interval between the 1st and 3d, scouts 2d and 3d squads, out as leading patrol. First squad will follow just inside the edge of the woods and have its scouts move up on that ridge (pointing to the ridge to the left) when the ground permits to check the progress

of the unit on our left. Intervals and distances will be maintained within the limits of visibility. I will move between the leading patrol and the first squad.

"Are there any questions? Get back to your squads. Get set to move immediately. Watch me for signals—I will give signal to move forward. Move out."

THE ADVANCE OF THE 1st PLATOON

By crossing the line of departure at the saddle between Hills N and O, the 1st Platoon entered the woods without casualties. Owing to the denseness of the underbrush, progress has been slow. At 12:30 PM the situation is as follows: See Figure 54.

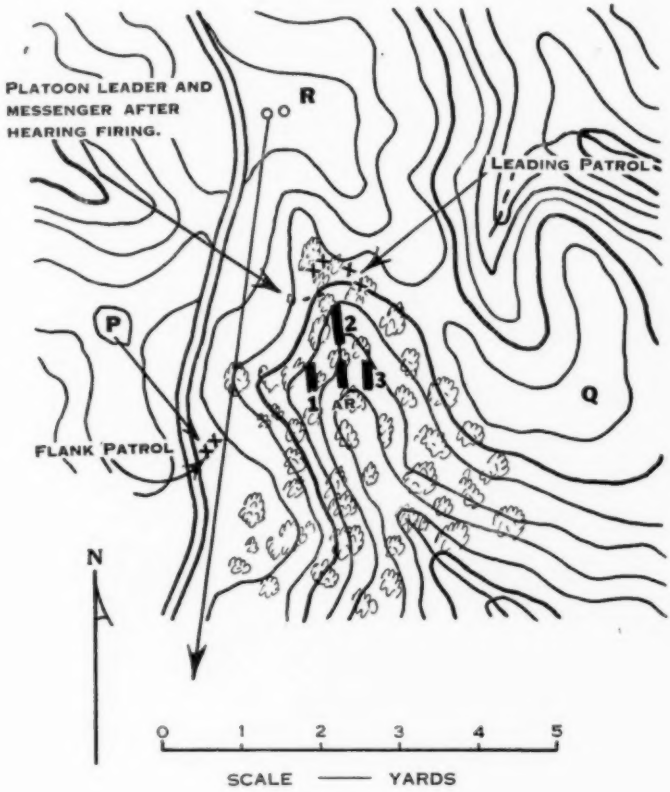

FIGURE 54.

As the two scouts of the 1st Squad, which was advancing on the left, reached the point indicated, an automatic weapon opened fire on them from Hill P. The scouts dropped down and took cover. The remainder of the platoon is halted in the formation indicated. Lieutenant 1st Platoon, accompanied by a messenger, was advancing in rear of the leading patrol when he heard the firing on his left flank. The machine guns reported on the high ground at R are firing, but apparently at targets in rear of the 1st Platoon.

LIEUTENANT 1st PLATOON

What would be the actions taken and the orders as actually issued by Lieutenant 1st Platoon to meet the situation?

DISCUSSION

By utilizing the defilade and cover available to him, the platoon leader of the 1st platoon has been able to advance his platoon some distance into a gap in the forward part of the hostile position. While the responsibility for contact with the units on the flanks was assigned to the reserve platoon in the company attack order, every leader is responsible for his own flank security. The movement of the scouts of the 1st Squad toward the high ground on the left flank forced the enemy group on Hill P to open fire and disclose its location. Upon hearing automatic fire on his flank, the platoon leader would move rapidly to some point such as that indicated on the sketch, where he could see the situation. He must then make a quick estimate of the situation in order to decide what course of action he is to follow. The hostile troops on the high ground at P are directly on his flank. While his men are at present defiladed from such fire, if they continue to advance to the north they will soon reach a position where the fire may strike them from the left rear. If the hostile group at P is ignored, and the platoon keeps under cover and continues its advance, a counterattack may strike them in the flank. Furthermore, the possession of the high ground at P is important to the company as a location for its light machine guns. On the other hand,

if the platoon continues but a short distance further, it will be in a position to bring flanking fire on Hill Q and thus carry out the scheme of maneuver prescribed by the company commander. The present location and the formation of the platoon is such that it may deploy to the left promptly and make an attack upon the high ground at P. While such an attack would be at variance with the scheme of maneuver announced by the company commander, unexpected situations frequently justify such a change of plan. This plan has another great disadvantage in that it is probable that many of the platoon would be exposed to flanking fire from the machine guns at R. Another plan which is feasible and practicable is for the platoon leader to emplace one or both of his automatic rifles somewhere near his present location where they can fire on Hill P and direct a small group to attack the hill using the small corridor to protect them from the fire of the machine guns at R. The hostile automatic weapon at P is a suitable target for the 60-mm mortars. Whatever action Lieutenant 1st Platoon takes he should notify the company commander of the situation and ask for mortar fire on hill P.

THE SOLUTION OF LIEUTENANT 1st PLATOON

Lieutenant 1st Platoon directs the messenger "Bring Sergeant Automatic Rifle Squad and Sergeant 1st Squad here at once." While awaiting the arrival of these squad leaders he looks for a good firing position for one of his automatic rifles. Upon the arrival of the sergeants he directs Sergeant Automatic Rifle Squad, "Two men of the 1st squad have been fired upon by an automatic weapon on that hill (pointing). You can hear the firing now, look in that clump of bushes to the right of the clump of trees, the gun is in there, but I have been unable to locate it definitely. Have one of your automatic rifles go into position there (pointing). Open fire on those bushes."

"Sergeant, 1st Squad, take your squad, keeping under cover in that low ground, move up along the road. I am asking for mortar fire on that clump of bushes hiding the

gun. When it lifts you rush the hill. Any questions? Move out."

He then writes the following message to CO Company I.

THESE SPACES FOR MESSAGE CENTER ONLY

TIME FILED	MSG CEN NO	HOW SENT

MESSAGE

(SUBMIT TO MESSAGE CENTER IN DUPLICATE)

NO 1 DATE 23 Oct 41

TO C.O. Co I 99 Inf

Request mortar fire on the clump of bushes msgr points out. Will have squad prepared to assault hill when mortar fire lifts

CO 1st Plat Co I 99 Inf (OFFICIAL DESIGNATION OF SENDER) 12-32 P (TIME SIGNED)

A.R. McGill (SIGNATURE AND GRADE OF WRITER) 1st Lt

He then calls the messenger, gives him the written message and says:

"You have heard my instructions to the two squad leaders. Go back to the company commander, tell him what has happened, point out the clump of bushes hiding that gun on the hill there (pointing), and give him this message."

THE ATTACK CONTINUES

Two 60-mm mortars opened fire on the enemy group at P. Under cover of this fire and that of the automatic rifle, the 1st Squad advanced up the ravine to the east of Hill P and drove the Red detachment off to the northwest. The squad then advanced north but were soon stopped by fire from high ground at R. The 2d Squad has advanced to the northern edge of the woods south of R and has been

stopped by fire therefrom. The automatic rifle squad and the 3d Squad are now in the wooded ravine south of the 2d Squad. (See Fig. 55.)

The two 60-mm mortars have gone out of action and are advancing in the zone of the 1st Platoon.

The 2d Platoon has advanced slowly through the woods against Hill Q and is now receiving heavy rifle, automatic rifle, and machine-gun fire from that hill which is causing serious losses. From the edge of the woods, near the right of the 2d Squad, Lieutenant 1st Platoon observes the situation on the right.

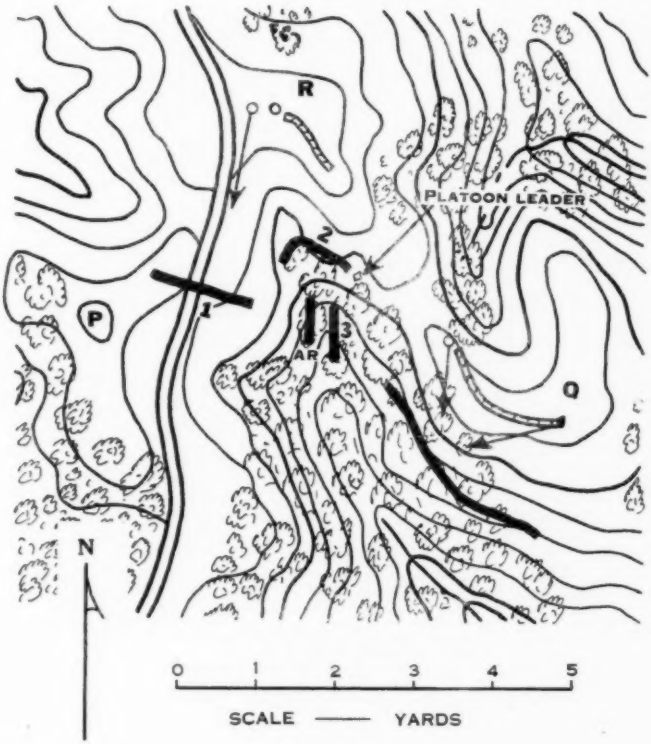

FIGURE 55.

LIEUTENANT 1st PLATOON

What action should Lieutenant 1st Platoon take and what orders should he issue in order to further the scheme of maneuver of the company?

DISCUSSION

In many situations, the mere presence of troops in position to threaten their rear, will cause defending troops to withdraw. Again with well trained and disciplined troops, properly prepared for all-around defense, we may find a garrison holding out even though it is being actively attacked on all sides. In the more usual situation some threat of direct action against the flank or rear of a defender in addition to the supporting fires will divert sufficient attention to enable the unit making the direct attack to launch its assault.

THE SOLUTION OF LIEUTENANT 1st PLATOON

Lieutenant 1st Platoon calls Sergeant Automatic Rifle Squad to him and says, "The 2d Platoon has been stopped by fire from that high ground. Put your two automatic rifles in position near here and open fire on the enemy there" (pointing to high ground at Q.)

He then calls Sergeant 3d Squad and directs him as follows, "Put your squad in action along the edge of the woods there to the right of the automatic rifles. Open fire against troops on that hill (pointing to Q) but do not advance beyond the edge of the woods."

MORE

The effect of the flanking fire from the automatic rifles and the 3d Squad in connection with additional supporting fires from weapons of Company M, enabled the 2d Platoon to drive the enemy from Hill Q. The machine guns on the high ground at R have switched their direction of fire and are now sweeping the ridge from R to Q with grazing fire which prevents the 2d Platoon from occupying Hill Q or passing over it into the ravine north thereof. Otherwise,

the situation of the 1st Platoon and the remainder of Company I is as in the previous situation. Lieutenant 1st Platoon is near the position of his automatic rifle squad.

LIEUTENANT 1st PLATOON

What actions should Lieutenant 1st Platoon take at this time and what orders should he issue?

DISCUSSION

Using all available cover and supporting fires, small units work up as close as possible to the hostile position. Then, if the enemy continues to hold his position, he must be driven out by direct assault. This assault may be launched in a number of ways depending upon the situation and the characteristics of the leaders. An individual may, on his own initiative, jump up with a yell and start a rush which is joined by men on either side, and an instinctive assault results. A squad leader, whose squad has a covered route of approach close to the hostile position, may work his squad up close, get them in hand, and lead them in an assault which he controls. Again, as in the situation confronting the 1st Platoon of Company I, one platoon may be able to work up within assaulting distance of an objective while the other platoon is unable to get close enough to participate. Conditions may require that an assault be organized by a company commander or a battalion commander.

The method of conduct of an assault likewise varies greatly depending upon the size of the unit initiating it and the distance to be covered before entering the hostile position. Small units, equipped with hand grenades may work up within grenade range, hurl grenades and rush the position in one quick bound, or the position may be rushed in one quick bayonet charge without the use of grenades. Larger units may start the assault from a distance of 200 yards or more, employing assault fire to maintain fire superiority. In any event, the final entry into the position is made at a run.

THE SOLUTION OF LIEUTENANT 1st PLATOON

Lieutenant 1st Platoon writes the following message:

THESE SPACES FOR MESSAGE CENTER ONLY

TIME FILED | MSG CEN NO | HOW SENT

MESSAGE

(SUBMIT TO MESSAGE CENTER IN DUPLICATE)

NO 2 DATE 23 Oct 41

TO CO Co D 99 Inf

Enemy driven from hill O

2d Plat cannot advance account enfilade fire from R. Regmt mortar fire on MG's at R. Am preparing to assault. Will fire green signal for supporting fire to lift

CO 1st Plat Co D 99 Inf (OFFICIAL DESIGNATION OF SENDER) | 1-10 P (TIME SIGNED)

A. R. McG. (SIGNATURE AND GRADE OF WRITER) 1st Lt

Handing the message to the messenger he directs, "Take this to the company commander."

He then directs Sergeant Automatic Rifle Squad who is nearby, "Shift the fire or your automatic rifles to that high ground", (pointing to R).

Moving quickly under cover of the edge of the woods he joins Sergeant 3d Squad and says, "The second squad is held up by fire from that ridge (pointing toward the position of R). Machine guns located there are holding up the 2d Platoon. We are going to assault that position. Switch the fire of as many of your men as possible to the enemy in front of the 2d Squad. Fix bayonets and be prepared to assault on green signal which I will fire from position near the automatic rifles. Do you understand?"

He next joins Sergeant 2d Squad and says, "I have asked for mortar fire on these machine guns. The 3d Squad is deployed on your right. Be prepared to launch an assault when I fire a green signal from there (pointing). Do you understand?"

He then returns to his position near the right of the 2d Squad, watches the fire on the hostile position and after the mortars have placed their fire for effect, which was seen bursting around the machine guns, fires the green signal, calls out, "All right, gang, let's go," jumps up and leads the assault.

THE PLATOON PREPARES TO CARRY ON

The assault of the 2d Squad reached the machine guns and destroyed or captured the crews. One gun is still serviceable. The few remaining enemy riflemen on Hill R disappeared in the woods north thereof. The platoon is badly scattered and confused. Some men are continuing to advance, and there is a lot of promiscuous shooting. In general, the 1st Squad is still back along the ridge between P and R, the 2d Squad on high ground at R, and the Automatic Rifle Squad and the 3d Squad on the ridge between Q and R. Lieutenant 1st Platoon with a messenger is in the vicinity occupied by the machine guns at R. Sergeant Platoon Guide is in the edge of the woods in the draw to the south. Lieutenant 1st Platoon knows there have been several casualties, but except for the Platoon Sergeant, who was seriously wounded, he is unaware as to the exact number or which of his other noncommissioned officers are casualties.

LIEUTENANT 1st PLATOON

What actions should Lieutenant 1st Platoon now take and what orders should he issue?

DISCUSSION

The period immediately following a successful assault is a critical one. Units are usually intermingled, subordinate leaders may have become casualties, some men will attempt

to pursue the withdrawing enemy, others will have stopped on the position, probably wandering around looking for souvenirs. It is during this period of confusion that counterattacks are most dangerous, and when the enemy will make every effort to launch them. Only prompt, energetic leadership can regain control and restore order. The principles to be followed and the specific things to be done may easily be listed. However, the difficult part is to get them done under the conditions which will exist. The enemy should be pursued *by fire* to the limit of effective range; men and weapons posted to cover the reorganization; squads reorganized; leaders replaced; ammunition collected from wounded and redistributed; the company commander informed of the situation and the platoon prepared to carry on, either in accordance with orders previously received or in anticipation of a new mission or objective to be received.

THE SOLUTION OF LIEUTENANT 1st PLATOON

Lieutenant 1st Platoon immediately upon the success of the assault, blows his whistle and signals: "Halt". He then joins Sergeant 2d Squad and directs him, "Post your two scouts on the forward slope of this hill, to cover your reorganization, put a couple of men on this captured gun and get it turned around so they can cover those woods. (Pointing to woods just north of R), then get the rest of your men back of the hill, check on their condition, take the ammunition from any wounded who are to go back and make a redistribution of all ammunition in the squad. Let me know what casualties you have had."

He then moves back off the hill and starts for the automatic rifle squad, meanwhile, signaling Sergeant Platoon Guide to join him "on the double." When the sergeant joins him, he directs, "You are the Platoon Sergeant now. Go over to Sergeant 1st Squad direct him to assemble his squad at once in the ravine where you were. Have them check and redistribute ammunition and let me know what casualties they have had. Understand? Hurry!"

He then joins Sergeant Automatic Rifle Squad and directs him, "Put one of your automatic teams on the nose there (pointing to the nose just west of the woods east of R) and the other on the high ground near the road to cover our left. Check up on your ammunition and let me know how you stand."

He next joins the 3d Squad and finding the squad leader has been wounded but is still present with his squad, he directs, "Sergeant, you turn over your ammunition to the Corporal and you get back to the aid station. Take care of yourself and we'll be seeing you soon again."

He then directs the Corporal, "You take charge of the squad. Send two scouts into these woods a short distance to give warning of a counterattack. Then get the rest of the men back of this ridge, redistribute ammunition, appoint a second-in-command and get ready to move out again. In case of a counterattack, get your men into position on the run and shoot like ————. Do you understand? I'll be back soon."

He then takes a quick look and seeing that things are going as he directed, sits down and writes the following message to his company commander:

THESE SPACES FOR MESSAGE CENTER ONLY

TIME FILED | MSG CEN NO | HOW SENT

MESSAGE

(SUBMIT TO MESSAGE CENTER IN DUPLICATE)

No 3 DATE 23 Oct 41

To CO Co I 99 Inf

Have taken high ground at R. One captured MG unusable. Plat Sgt and Sgt 3d Sqd wounded. Several men killed and wounded, think I have about 35 men left. Sending 2 prisoners back with messenger. I have sufficient ammo to continue mission

CO 1st Plat Co I 99 Inf | 1146

OFFICIAL DESIGNATION OF SENDER | TIME SIGNED

A. B. McG

SIGNATURE AND GRADE OF WRITER | 1st Lt

He then makes the rounds of his squads to check on their condition and prepares to resume the attack.

BACK TO THE WEAPONS PLATOON

Upon receipt of the request for mortar fire on the machine guns at R, the two mortars were emplaced with sight defilade on the ridge east of P and the fire delivered, ceasing upon the green Very pistol signal from Lieutenant 1st Platoon. Lieutenant Weapons Platoon, from a position near the mortars, observed the effect of their fire. From his position he sees some of the men of the 1st Platoon reach the high ground and take the hostile machine gun.

The light machine-gun section, under the direct control of the company commander was kept under cover in rear of the 1st Platoon until the hostile troops were driven from the high ground at P. At that time Captain Company I directed Sergeant Light Machine Gun Section to move his section into position on that high ground and place fire on the hostile position at R. From this position Sergeant Section Leader observed the successful assault of the high ground at R.

ACTIONS OF THE WEAPONS PLATOON

What should be the actions taken and the orders issued by Lieutenant Weapons Platoon and by Sergeant Light Machine Gun Section in this situation?

DISCUSSION

The terrain in the zone of attack of Company I, during the advance to the initial company objective, has made it impossible to organize the supporting fires of the company to assist the advance. The only possible firing positions for these weapons are on the high ground along the left. From positions available, no assistance could be rendered the right platoon. Therefore, the light machine-gun section was not employed until the high ground at P was available.

It is essential that the supporting weapons get forward promptly whenever an objective is captured. Not only in order that the weapons be in position to resist counterattacks but also, that they be prepared to place their fires to support a further advance of the company. Platoon and section leaders constantly extend their reconnaissance to the front to select new firing positions and routes of advance thereto. The checking of available ammunition and timely request for replenishment is an important responsibility of leaders during this phase of the attack. In order to permit the company commander to make necessary plans and arrangements for timely ammunition supply, platoon leaders should report their ammunition situation periodically.

The method of ammunition supply for the Weapons Platoon during the attack will depend upon the type of transportation available in the unit concerned and the type of control exercised by the company commander. If the company has two ½-ton, 4x4 weapon carriers, one will carry 162 rounds of 60-mm mortar ammunition, and the other 6,000 rounds of ammunition for the light machine guns, in addition to the weapons. Upon going off-carriers, one half of this (27 rounds per mortar and 1,500 rounds per light machine gun) will be carried forward by hand, leaving a total of 81 rounds of mortar ammunition and 3,000 rounds of light machine-gun ammunition on the carriers. If the organization has been issued three ¼-ton trucks in lieu of the two weapon carriers in accordance with Table of Basic Allowances, October 1, 1941, one truck will carry two mortars and 72 rounds of ammunition; one will carry one mortar and 90 rounds of ammunition; and the third will carry the two light machine guns and the 6,000 rounds of ammunition therefor.

In either case when the weapons are carried by hand, all remaining ammunition can be reloaded on one vehicle. Whether this shall be done and the weapon carrier or the two ¼-ton trucks, as the case may be, sent back under the transport corporal to the battalion ammunition distributing point to be refilled is a command decision to be made by the

company commander. Likewise, the decision as to when the loaded trucks shall be moved forward from the initial off-carrier position is made, normally, by the company commander. In some situations all carriers of the battalion are consolidated and controlled by the battalion transport officer. Again, in exceptional circumstances, when it is impossible to contact the company commander, the platoon leader of the weapons platoon may direct the movement of the trucks, reporting his action to the company commander as soon as possible.

When the company commander decides to move the weapon carriers, a messenger is sent to the old location with the instructions and the vehicles are moved under the direction of the transport corporal. The platoon leader of the weapons platoon and the sergeant commanding the light machine-gun section are notified of the new location.

THE SOLUTIONS OF LIEUTENANT WEAPONS PLATOON AND SERGEANT LIGHT MACHINE-GUN SECTION

Upon seeing the riflemen reach the high ground at R, Lieutenant Weapons Platoon commands, "Out of Action." He then checks on ammunition available and directs, "Number Three and Four of each squad, turn over any mortar ammunition you have to your Number Two. Number Three, Second Squad, take charge and return to the place where we left the carriers. Get a full load apiece and return to the head of that ravine there (pointing out the ravine just south of R). On the way to the rear, keep a sharp lookout for the carriers as the company commander may have them moving forward."

He then directs the Section Leader, "Follow me, keeping under cover," and moves rapidly along the edge of the woods to the head of the ravine where he directs the section leader, "Keep the men under cover here. I am going forward on reconnaissance." He then moves up on the high ground to select suitable possible target areas and firing positions for the future employment of the section.

Sergeant Light Machine Gun Section, upon seeing the riflemen reach the high ground at R, commands, "1st Squad, out of action; follow me. 2d Squad, remain here prepared to fire in case of a counterattack. When you see the 1st Squad go into position on that high ground (pointing to R) you go out of action and move forward, keeping under cover, to join them." He then moves rapidly toward R, accompanied by his messenger and followed by the 1st Squad. He keeps generally to the east of the crest of the ridge so as to be covered from hostile observation and fire. Upon arrival at R, he signals the squad to halt under cover and he craws up on the high ground near the road and selects a position area where the gun can fire either toward hill S or against a counterattack from the north or northeast. He then returns to the cover position and issues the following instructions to Corporal 1st Squad, "Put your gun in action there (pointing to the area selected), sector: from the hill to the left of the road to include the valley to your right front." He then directs the messenger, "Go to the company commander and tell him where I have moved the section. Ask him if the carriers are moving forward and if so where they will be. Return here."

He then waits until the 2d Squad arrives and issues the following order to the squad leader, "Go into position there (pointing to right of 1st Squad) sector from the hill on left of road to include the valley to your right front; watch for counterattack."

The sergeant then moves up to check the position of the guns and to select an observation post for himself.

CHAPTER 10

A History of the Infantry School

This chapter is an extracted portion (Chapter III: Sections 1 and 2) of a manuscript entitled "A History of The Infantry School." The history was written in 1931 by First Lieutenant Leroy W. Yarborough in collaboration with Major Truman Smith and with the assistance of Major Charles A. Willoughby and Major Leven C. Allen. The history covers a full and complete account of the development of the Infantry School idea for the training of officers. It includes the details of the establishment of the Infantry School of Practice at Jefferson Barracks, 1826-1828; The School of Musketry, Presidio of Monterey, 1907-1912; The School of Musketry, and The Infantry School of Arms at Fort Sill, 1912-1918; and The Infantry School at Fort Benning, 1919- .

Chapter I of this history appeared in Volume XX of The Mailing List, July 1940 and Chapter II in Volume XXXII, August 1941.

Military Events concerned with the Infantry School of Arms at Fort Sill and Camp Benning, 1918-1921.—The Role of the Citizens of Columbus and the Vicinity in the Establishment and Retention of The Infantry School at Fort Benning.

The period of three and a half years following the removal of the Infantry School of Arms to its new site near Columbus, Georgia, has no parallel in the school's history.

In the kaleidoscopic whirl of events which revolved about the school during that time there was a dramatic intensity which assumed an increasingly high pitch until its abrupt termination in an anticlimax of neglect. It began, figuratively, as the banishment of an overgrown stepchild from its home, when its too rapid war-time expansion led to its eviction from Fort Sill and its partial dismemberment and distribution between three widely separated camps. There followed the brief epoch of urgent haste to reunite its fragments and to resume its mass production of trained manpower; then the intervention of the armistice marked a new crisis in the school's career and opened a third epoch through which the school ran a long gauntlet of hazards of uncommon variety.

Efforts to establish the school near Columbus had been carried on for more than a year before it was finally moved to Camp Benning. Two clases of people were engaged in this endeavor, local citizens and army officers. Although the motives of each group differed slightly, their main efforts coincided sufficiently to accomplish the common end. After the armistice the status of Camp Benning, and likewise of the school, became uncertain. To some it appeared to be a war-time installation that would disappear with the passing of the conditions which created it. Soon after the termination of the war there developed a strong opposition to the maintenance of the school at Camp Benning. Forthwith began a lengthy and heated contest which divided the community and drew into the struggle groups of army officers and members of Congress. The camp's citizen proponents lauded it as an economic asset to the community. Its local opponents denounced it as a menace to religion, home, and womanhood. To the army officers, the infantrymen, particularly, it appeared to be an almost ideal location for an infantry school and, as it was already established, they desired to retain it. If the camp was abandoned, the school might not be reopened for years, if at all. It was a bird in the hand, so to speak. The interest of members of Congress, reflecting, no doubt, the views of their consti-

tuents, varied from downright indifference or hostility, to intense favoritism. The fate of the camp and the school, as well, several times lay on the lap of the gods, and the gods were not inclined to be friendly. Its survival through this long period of attack, revilement, and neglect is a miracle of accomplishment, a monument to the indomitable spirit of those who fought in its cause. In none of the major groups which participated in the contest over Camp Benning was there complete harmony. The aggregations of citizens and congressmen were divided into opposing factions, between which there was rank dissension, even hostility. Even in the army group there was not complete accord, and the loose statements of some officers were quoted by foes of the camp in the congressional hearings which later enhanced the importance, if not the dignity, of the contest. But of all who engaged in the struggle to continue the infantry's school at Camp Benning, none was more diligent nor zealous than the army group, yet the range of activities of none was more circumscribed than that of this group. Their share in the fray had to be conducted with circumspection, and their initiative of action could rarely extend beyond the limits of service routine.

As the characters of the respective groups differed, there was likewise a diversity of interests and a medley of motives inspiring their works. Most of their efforts progressed concurrently and in some cases, especially those of individuals, were overlapping. An attempt to recount their activities and the ensuing results in the exact order in which they took place would produce only a maze of words. For the sake of clarity, therefore, and a coherent exposition of the dramatic events of this most critical period in the history of The Infantry School, the roles of the principals, and the delineation of the physical progress and conditions of that period are presented separately. Even this method offers an imperfect solution to the problem of clarifying the muddle of events, and there unavoidably occurs some repetition in the narration of the Military Events Concerned with the Infantry School of Arms at Fort Sill and Camp

Benning, 1918-1921; the Role of the Citizens of Columbus and the Vicinity in the Establishment and Retention of The Infantry School at Fort Benning; the Role of the Congress in the Continuance of Fort Benning and The Infantry School; the Acquisition of the Land for the Infantry School; and the Early Construction Period and Living Conditions of that Time, which, all together, form this chapter.

The War Department's order directing the removal of the Infantry School of Arms to the new Columbus site was the climax of a long series of circumstances and events which ultimately led to the selection of this locality as the one available site which was nearest to the ideal for infantry training purposes. Official cognizance of the probable necessity of relocating the infantry's school was first indicated in July, 1917, and arose from conditions created by the rapid expansion of both it and the Artillery School of Fire, which taxed the limited facilities of Fort Sill beyond their capacity and led to petty friction between the two schools. (213) In this same year, too, at least four favorable reports had been made on the Columbus region by army inspectors or boards in the search for desirable training sites. (214) Although none of these had to do with the Infantry School of Arms, it is not improbable that the succession of favorable reports directed official attention toward Columbus. In January, 1918, General R. M. Blatchford examined the Columbus locality among others in a search for a site for a small-arms firing school, an associate activity of the Infantry School. (215) In July the board*, of which Colonel Eames was president, designated it as second choice in case the site near Fayetteville, North Carolina, could not be secured for the infantry's school. (217) An inspection of land adjacent to that selected by Colonel Eames' board near Fayetteville had been made in

(213) Letter A. G. O. July 23, 1917 Marr.
(214) Malone, p. 38.
(215) Malone, p. 38.
* See P 74.
(216) S. O. 119, W. D. 1918.
(217) Malone, p. 38.

the preceding month by Colonel E. P. King, Jr., of the field artillery in a search for a training ground for that arm. Colonel King's selection of that locality was subsequently confirmed by the Secretary of War. (218) This left the Columbus region as the best one available for the infantry, and as a result of a study made by the general staff during July and August it was designated as the locality in which would be situated the Infantry School of Arms upon its removal from Fort Sill. (219) The plan at that time contemplated the acquisition of 250,000 acres of land for a school with a capacity of 30,000 officers and men. (220) In the meantime, the construction division of the general staff had commissioned Majors Solomon and Gibb to select a site for cantonment in the vicinity of Columbus. On July 12 they announced their selection of a site on the Macon road about three miles east of Columbus, which lay between two main railroad lines. (221) Later in the same month Colonel Clopton, of the tanks corps, recommended the area near Columbus as especially suited for a tank school. (222) In September, following the Chief of Staff's approval of the recommendation of the training branch of the general staff that the Infantry School of Arms be removed from Fort Sill, orders were issued by the War Department on September 12* which directed the transfer of the school to Columbus. Similar orders were issued at the same time to the school's offshoots, the Small-Arms Firing School, at Camp Perry, Ohio, and the Machine-Gun School, at Camp Hancock, Georgia. (223)

Colonel Eames arrived in Columbus on September 21, (224) and he lost no time in preparing for the arrival of the remainder of the personnel and the reopening of the Infantry School of Arms in its new location. He at once established his headquarters in Columbus in a building at

(218) Malone, p. 38.
(219) Malone, p. 39.
(220) Malone, p. 39.
(221) Malone, p. 39.
(222) Malone, p. 39.
* Chamberlain, p. 4, indicates that the orders were not actually issued by the Adjutant General until September.
(223) Annual Report Chief of Staff W. D. 1919, p. 315.
(224) Chamberlain, p. 5

the southwest corner of First Avenue and Thirteenth Street where were located the offices of the construction firm which was to build the cantonment to house the school. (225) One of the first matters to engage Colonel Eames' attention was that of providing shelter for the troops who were due to arrive in little more than a week. Plans for a temporary camp and the problems in connection with its construction were discussed during a conference which Colonel Eames held on September 23 with Major John P. Jones, Quartermaster Corps, and representatives of the contractors who were to build the temporary camp. On the following day Colonel Eames visited the area east of Columbus which was then the proposed site of the cantonment, and designated the location of the temporary camp for the school. On Major Jones he imposed the responsibility of having the camp in readiness for the expected arrival of the troops soon after October 1. (226)

In the meantime, representatives of the two other schools which were to be absorbed by the Infantry School of Arms, had arrived in Columbus, and with them, Colonel Eames discussed the requirements of the consolidated school preparatory to the designation of the actual site it was to occupy. (227) While the area east of Columbus, which had already been selected as the site of a cantonment, appeared to be satisfactory for general war-training purposes, it did not entirely fulfill the technical requirements of the Infantry School of Arms. On September 25 Colonel Eames, and Majors Critchfield and Maloney, of the Small-Arms Firing School, located an area on the south side of Columbus which appeared to possess topographical features which were more suited to the needs of the school. One of these was a site for a class "A" rifle range, an important feature of the installation of the consolidated school. (228) Although Colonel Eames' board had originally endorsed the area near Fayetteville, North Carolina, as its first choice, Colonel Eames evidently found the Columbus site, on closer ac-

(225) Bradley
(226) Jones, Report pp. 21-23.
(227) Eames, p. 3.
(228) Eames, p. 3 Jones' Report p. 1 Malone, p. 39.

quaintance, to be the better of the two, for just a few months later he gave his unqualified approval to its superior qualifications. He said in the course of his testimony before the Senate Military Affairs Committee at that time: "The commanding generals of the Western Department, the Southern Department, and Southeastern Department were each directed by the War Department to send a board of officers into all the states comprised in their departments in order to locate a suitable place for this school. These boards went out and spent a month or two in a careful examination of hundreds of sites, extending from California to Virginia, and in every state between. As a result of that, the three boards reported certain sites as suitable, and certain others as quite unsuitable. After a period of time, the proceedings of these boards were sent to me as president of the fourth board, and I examined them; and my board went over the territory, as I say, from the Pacific to the Atlantic looking for a site that would meet the military requirements of the school, with which I was familiar; and this place at Columbus was decided upon in preference to anything we saw." (230)

October was a month of rapid physical development for the reunited school. On October 4 a number of instructors arrived from Fort Sill. (231) On the fifth, Colonel Eames was appointed commandant of the Infantry School of Arms to succeed Colonel Miller, who had not come to Columbus. (232) On the sixth, the first troops arrived from Fort Sill. These were the two officers and five hundred and three men comprised in the Infantry School of Arms Detachment, and a medical officer, who arrived at their destination at two o'clock in the morning. (233) Colonel Morton C. Mumma, commandant of the Small Arms Firing School, at Camp Perry, Ohio, preceded his command by a few weeks, and arrived in Columbus on the eighth. (234) Favorable changes in the war situation in Europe resulted in the approval by

(230) Land for Artillery, etc., pp. 74-75.
(231) Ledger Oct. 4, 1918.
(232) S. O. 234 W. D. 1918.
(233) Stewart.
(234) Ledger, Oct. 8, 1918.

the Secretary of War on October 9, of modified plans for the Infantry School of Arms which reduced its capacity to 24,000 officers and men, and its area to 115,000 acres. (235) This action was followed on October 19 by the Secretary's approval of an expenditure of $3,600,000 to purchase for the school a tract of land comprising 115,000 acres, the boundaries of which were left to the discretion of Colonel Eames. (236) On the nineteenth also, local attention was concentrated momentarily on the temporary camp when, in compliance with a request made in September by the Rotary Club, it was ceremoniously christened "Camp Benning." (237) * Legal machinery for the acquirement of the lands for the school was set in motion on October 23 by the request of the Secretary of War to the Attorney General of the United States to institute condemnation proceedings on behalf of the Government. (238) The arrival on October 26 and their assignment to the Infantry School of Arms of forty officers and seven hundred men of the Small Arms Firing School, completed the transfer of personnel and ended the brief career of that institution. (239) On October 28 the contract for construction of the camp was awarded. (240)

Construction work for the new camp, and local condemnation proceedings to acquire the 115,000 acres of land comprised in this area, were both started on the second of November (241) and began what promised to be a month of rapid progress in the reestablishment of the school. But in little more than a week came the armistice. The effect of this momentous event, which ended the greatest conflict the world has ever suffered, was not immediately apparent at Camp Benning. The construction work at the new site proceeded as rapidly as the contractors' facilities permitted, (242) and the school, on December 2, enrolled a class of about one hundred recent West Point graduates and re-

(235) Eames, n. 3 Jones' Report p. 1.
(236) Jones' Report p. 1 Malone, p. 39.
(237) Hq. File, Ft. Benning.
* See P. 329.
(238) Malone, P. 39.
(239) Chamberlain p. 5.
(240) Jones' Report p. 29.
(241) Jones' Report p. 29 Malone, p. 39.
(242) Jones' Report pp. 31-32.

sumed its courses of instruction (243) as if nothing had happened. It was, of course, a matter of general knowledge that the ending of the war would ultimately affect conditions at Camp Benning but to what extent was not known. However, the construction division of the general staff was even then working on a revision of the plans of the school on a peace-time basis, and on December 26, the modified plans which reduced the school's capacity to 10,000, were completed. At the end of the year the school had two sites but it had yet no home and its personnel of approximately 125 officers and 1,200 men were still occupying the temporary camp east of Columbus.

For Camp Benning and the Infantry School of Arms the arrival of 1919 marked the advent of a long period of uncertainty and hazard. Vague apprehensions disturbed those to whom the future of the infantry's school was a matter of concern. Rumors that the camp, and likewise, the school, was to be abolished, reached Columbus. Already opposing interests were marshalling their forces for the contest which was to decide the fate of the camp.

On January 9 the Assistant Secretary of War issued orders which directed the suspension of construction and land acquirement and the salvaging of all materials and construction work, either wholly or partially completed. (244)

Since its removal to the Columbus site the school had undergone a series of reductions in area and training capacity. Originally intended as a school for 30,000 officers and men, its personnel capacity was successively reduced to 24,000 and then to 10,000, which latter figure represented its proposed peace-time capacity. Its area, too, which had begun at a quarter of a million acres had dwindled to 115,000. It soon became evident to the military authorities that even more extensive reductions would have to be made in the project if the camp was to be retained for a peace-time school. Soon after the cessation order had halted the construction at the camp, Colonel Eames and Major Jones were called upon by the war-plans and construction divisions of

(243) Chamberlain p. 6.
(244) Malone, p. 40.

the general staff to assist in preparing plans and estimates for a peace-time infantry school with a personnel capacity of 5,040 and an area of 98,000 acres. This work was completed and the new plans were transmitted to the operations division on January 27. (245)

Paradoxically, it would seem that while a steady process of physical contraction was being applied to the school, the month of February presaged the adoption of a policy of immense expansion of the scope of the school's work. The trial of combat had revealed many latent defects in our infantry training methods and had emphasized others which had been self-evident but unavoidable in the hasty mass production of new infantry officers. Contemplation of these flaws in the infantry's war-effort developed quickly a realization of the necessity for finding means of obtaining uniformity and greater efficiency in infantry training methods. The infantry's school was regarded as the proper instrument with which to accomplish this end and forthwith was begun a study of a plan to broaden to the character of the school from one dealing primarily with the technic of armament to an institution whose teachings would embrace the entire field of infantry tactics and would impart, as well, a knowledge of the cooperation of infantry with other arms. (246) From these deliberations, which were to exert a strong influence on the future character of the school, no conclusions were manifested until fall. (247) On February 22 the West Point class which had begun a short course of instruction in December was graduated. (248)

March began as a harbinger of material progress, for on the eighth the Assistant Secretary of War issued orders which directed the continuation of the execution of the peace-time plan of the school. An expenditure of $9,200,000 was allowed, of which $6,600,000 was for construction, and the remainder for purchase of land. (249) Officially, the work of building the camp was resumed. Actually, it

(245) Malone, p. 40 Chamberlain p. 5.
(246) Malone, p. 40 Chamberlain pp. 5-6
(247) G. O. 112, W. D. 1919.
(248) Chamberlain p. 6.
(249) Malone, p. 40.

had never entirely stopped, despite the mandate of January. Major Jones, the constructing quartermaster, who seems to have been an officer whose talents included rare qualities of initiative, ingeniously interpreted his instructions to salvage the work as meaning to carry on to completion all partially finished buildings, and then to preserve them from deterioration by the application of paint. (250) However, superior authority of that time may have regarded his adroit translation of his orders, his operations were of immense practical permanent value in the development of the embryonic camp.

After a respite of three weeks, instructional work was resumed when a new class of student officers was enrolled on March 15 for a three-month course. (251) On March 23 the garrison of Camp Benning was augmented by the arrival of the 1st Battallion of the 29th Infantry from the demobilization center at Camp Shelby, Mississippi. (252)

Early in April the reunion of the school's dismembered parts was completed by the arrival on the third of some two hundred men of the Camp Hancock machine-gun center and their consolidation with the personnel of the school on the fifth. This detachment, which included two demonstration machine-gun companies, one animal-drawn and the other motorized, was accompanied by a number of officers, both instructors and students. (253) Colonel Eames concluded his important labors as commandant on April 22 upon the arrival of his successor, Major General Charles S. Farnsworth. (254) Colonel Eames thereupon became executive officer of the school. (255)

On June 17 began the removal of the Infantry School of Arms from the temporary camp on the Macon road to its new, but as yet uncompleted, home at what is now Fort Benning. (256) Uncertainty still obscured the future of the new camp. The local authorities, actuated by an ardent de-

(250) Columbus Ledger Feb. 22, 1925.
(251) Chamberlain p. 6.
(252) Goodale Stewart
(253) Chamberlain p. 5 Wagner.
(254) Chamberlain pp. 12-14.
(255) Galley Proof 12.
(256) Galley Proof 12 Wagner.

sire to save the camp for the school, did everything they could toward effecting this end. One of their plans, by which they hoped to avert abandonment of the camp, was the production of an appearance of intensive training activity to impress congressional or other influential observers. The idea seemed to be that the presence of a large class of student officers engaged in important studies would make less feasible an interruption of the school's career, and might also aid to divert any sentiment which favored such a move. (257) At any rate, this is the only explanation which has been advanced to account for the decision to retain the class of officers which should have been graduated on June 15, for an additional three-month course. While the school was in process of removal and settling, the students enjoyed a two-week holiday period, during which they recuperated to some extent from the enervating effects of a long spell of hard work in the high temperatures of summer. They returned to their classes on June 30 and carried on their strenous work of bayonet combat, drills and firing of weapons in the intense midsummer heat. It was a trying ordeal and a severe test of morale. (258)

The months of June and July saw a succession of curiously contradictory orders which alternately granted carts blanche authority to proceed with the development of Camp Benning and summarily checked such activities. The authorization which the Secretary of War had given in March for the completion of the project had allotted approximately $2,600,000 for the purchase of the land required. On June 5 the officer in charge of the acquirement of land was told "to spend as much as may be needed" for the procurement of the 98,000 acres which the camp was to have, although it was apparent even then that the transaction would require more than the allotted sum. (259) On July 1 the Secretary of War again placed an official ban on all construction work and purchase of land for Camp Benning. (260) All unexpended funds hitherto allotted for these purposes were

(257) Brady, Jackson.
(258) Wagner, Jackson.
(259) Land Acquisition, Q. M. Files, p. 6.
(260) Malone, p. 40.

to revert to the United States Treasury. Apparently the injunction did not affect operations at Camp Benning until July 5, for the local quartermanter records show that land purchases and construction work ceased, officially, on that date. (261) Local enterprise again met the situation. With such materials as were at hand the inhabitants of the camp set about improving their living conditions and, despite the sharp limitations placed upon such activities, they accomplished a great deal before winter. (262) This, and the previous local solution of pressing problems, seemed to prove that there is more than one way of killing a cat or of saving an infantry school.

In June, also, Colonel Paul B. Malone was recalled from duty with the Army of Occupation in Germany to become assistant commandant of the Infantry School of Arms. He was also to act as representative of the War Department to acquaint Congress with the necessity for, and the objectives of the school, and to endeavor to induce that body to approve the project. Colonel Malone's duties in Washington as liaison officer between the War Department and Congress began in July and extended over a period of eight months. (263) One of his first acts was to begin the preparation of a digest of information on matters relating to the school plan for the members of Congress. The importance of an infantry school in the army's educational system was cogently demonstrated by an analysis of the American casualties of the World War. This showed that the infantry suffered 89 per cent of the combat casualties and indicated certain deficiencies in training. A school for the infantry, he argued, was an absolute necessity, no matter what the size of the army was to be. (264) By a brief discussion of the general features of existing army posts, cantonments and camps, he proved that the Camp Benning area was the only available one which fulfilled the requirements of an all-year-round infantry school. (265) He outlined an organization plan and

(261) Land Acquisition, Q. M. Files, p. 6.
(262) Chamberlain, Farnsworth Indorsement.
(263) Chamberlain, Malone Indorsement.
(264) Malone pp. 3, 12.
(265) Malone pp 20-21.

the new character of training for commissioned and noncommissioned personnel of the three components of the army. (266) He procured the approbative statements of such eminent soldiers as Generals Hunter Liggett, Robert L. Bullard, and Charles P. Summerall. (267) Among others, endorsements of the scheme were given by the chief of the tank corps, then a separate arm, the director of air service, the chief of the militia bureau, and by two influential civilian organizations, the Military Training Camps Association and the National Rifle Association. (268) About two hundred infantry officers and several officers of other arms participated in the work of acquainting Congress with the necessity of completing the Camp Benning project. (269)

An impetus was given to the school's instructional activities on July 10 when two classes of noncommissioned officers began a three-month course. On September 5 another class of officers arrived for a physical training course of one month. (270) With two classes of officers and two of noncommissioned officers in session at one time, the school presented a scene of bustling training activities, as the authorities no doubt had intended it should, when Colonel Malone conducted a congressional inspection committee to Camp Benning in the fall. (271)

The study which the general staff had begun on the question of infantry training resulted in a definition of policy which was announced in War Department general orders on September 25. (272) The infantry was to have its own special service school which was "to develop and standardize the instruction and training of officers in the technic and tactics of their arm of the service". The infantry's school was to operate under the supervision and control of the chief of infantry,* who was directed to draft special regulations for the conduct of the school. (273) General Farnsworth, assisted by Colonel Malone and Colonel Monroe C.

(266) Malone, pp. 16, 17, 18, 20, 41, 42.
(267) Malone, pp. 14, 15, 32, 33, 46, 47, 48.
(268) Malone, pp. 43, 44, 45, 49, 51, 52.
(269) Chamberlain, Malone Indorsement.
(270) Chamberlain, p. 6.
(271) Chamberlain, Malone Indorsement.
(272) G. O. 112 W. D. 1919.
* Gen. Farnsworth was appointed chief of infantry, July 1, 1920.
(273) G. O. 112 W. D. 1919, pars. 13-18.

Kerth, at once began the preparation of the regulations, and in January, 1920, submitted a draft to the War Department. (274)

On September 30 was finally graduated the class which had begun in March a course which should have ended in June. A new class of recent West Point graduates arrived on October 1. (275) On October 15 the remainder of the 29th Infantry arrived from Camp Shelby. (276) Colonel Eames was placed in charge of the school's department of experiment on November 1 and was designated a member of the Infantry Board on December 24. (277) Mobile Laundry Unit No. 5 arrived on November 5 but it did not operate until the following year. (278) General Pershing came to Camp Benning on December 10 to inspect the school. Seas of mud, overflowing streams, liquid roads, and a sodden camp, awaited him. The inundation which resulted from a downpour of several days' duration prior to his arrival, is known to this day as the "Pershing Flood."

At the close of 1919, the infantry's school, to outward appearance, at least, had made little advancement toward permanency, and, friendless and forlorn, was still floundering in a quagmire of uncertainty.

The new year, 1920, began with little promise, and January was void of accomplishment until the 23rd, when General Farnsworth sent the draft of the new school regulations to the War Department. The importance of this document in shaping the character of the school was not evident, however, until several months later.

The month of February had, in previous years, held a singular significance for the school. February 1920 was to be no exception, for on February 11 was received the War Department order which invested it with the dignity of a distinctive title, "The Infantry School." (279) The official christening of The Infantry School was the outcome of the approval of a recommendation which General Farnsworth

(274) Chamberlain pp. 7, 18-19.
(275) Chamberlain p. 6.
(276) Doughboy 1920-1921.
(277) Galley Proof p. 17.
(278) Chamberlain p. 13.
(279) G. O. 7, W. D. 1920.

had made in August (280) and which, in turn, had come about as a result of a conversation with Colonel H. S. Wagner late in July. (281) February 20, 1920, will ever remain a red-letter day in the history of The Infantry School, for it was on this date that Congress approved the plan to retain and develop Camp Benning. (282) The promise of support for the school plan which Represenative Anthony, of Kansas, and other members of the committee had given to Colonel Malone when they visited Camp Benning, had not been an empty one. (283) At last the status of The Infantry School was definitely fixed and plans for its conduct and development could proceed with confidence. From February to April plans for clothing the school in its new character as The Infantry School were being perfected along the lines which had been indicated in the tentative regulations which General Farnsworth had submited in January.* (284) These were approved and published by the War Department as Special Regulations No. 14, April 22, 1920.* In them were prescribed the new organization of The Infantry School, the duties of its staffs and departments, the classes of students and the manner of selecting them, the courses for the respective classes and the methods by which they would be carried out. Some idea of how far the process of evolution had advanced the character of The Infantry School beyond that of its antecedent of 1907, may be gleaned by a comparison of the respective objectives and organizations of the two schools. The immediate objective of the earlier school was to raise the marksmanship standards of the Pacific Division by giving to "selected officers and enlisted men a higher degree of practical and theoretical instruction in the use of small arms than it is practicable to obtain at posts, with a view to making them better instructors and thereby increasing the fire efficiency of the organization to which they belong." The school staff at this time

(280) Chamberlain pp. 6-18.
(281) Wagner.
(282) Chamberlain p. 7.
(283) Chamberlain, Malone Indorsement.
* See p. 95.
(284) Chamberlain, p. 7.

consisted solely of an officer in charge and an assistant instructor.* (285) More comprehensive were the purposes of the later school. "The chief aim of all courses will be to develop in the student the quality of leadership and the capacity to instruct others. Instruction in research will form part of each course with a view to developing the habit of independent investigation and thus arriving at conclusions by analysis and deduction," reads a paragraph in the special regulations of the 1920 school. For the organization of the school, the latter prescribed a commandant, an assistant commandant, a secretary, a director for each of the four departments, and such instructors and other assistants as were required. (286) The scope of instruction of The Infantry School had grown, almost immeasurably, from a curriculum limited to subjects related to marksmanship and musketry, to the whole field of technic of the numerous modern infantry weapons, the tactics of all units to, and including, the reinforced infantry brigade, and the cooperation of infantry with other arms. Students for the Monterey school were drawn from a limited area and command, while the Infantry School of 1920 was opened to the infantrymen of all three components of the army.*

With its new investitures of title, estate, and career, an era of renaissance had begun for The Infantry School. It had not yet recovered its strength but it had no longer to expend all its energy in a struggle for the right to exist.

In the Spring of 1920, several small increments of demonstration troops were added to the garrison. The 32d Balloon Company came in March, the 344th Tank Battalion and Company D 7th Engineers in April, and a detachment of the air service with 10 airplanes, in May. (287)

On June 5 Colonel Eames departed from The Infantry School to take up new duties elsewhere in compliance with orders which had been issued in April. (288) On July 31

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* See Special Regulations 14, Appendix.
* See pp. 13-15.
(285) G. O. 4, Pacific Division, Feb. 21, 1907.
(286) S. R. 14, W. D., 1920.
* See Special Regulations 14, Appendix.
(287) Doughboy, 1920-21.
(288) Chamberlain, Malone Indorsement par. 5; Chamberlain p. 13.

General Farnsworth was relieved as commandant to become the Chief of Infantry, with the rank of Major General. (289) Brigadier General Walter H. Gordon was appointed his successor, and he arrived to take command on September 20. (290)

The school year of 1920-21 was the first in which were conducted the prescribed courses of the modern Infantry School. Since the issuance of the special school regulations in April, the War Department had added to the mission of the school the requirements of training efficient commanders and staff officers for all units, and of preparing officers for the advanced training given in the general service schools. (291) The new courses, amplified to meet the additional requirements, were scheduled to begin on October 1, but unsettled conditions in the service made it so difficult to assemble the students that the classes did not commence until November 1. An exception was that a group of recent graduates of the military academy who arrived in time to begin the basic course on October 1. This group was carried as a separate class throughout the school year as it had advanced too far in its work to be merged with the other basic group upon the latter's arrival. Approximately 650 regular officers reported for enrollment in the four classes, the field officers', company officers', and the two basic classes, but the actual enrollments were reduced somewhat by the necessity of using prospective students to fill vacancies in the school staff and post organizations. (292) A national guard class, the first of the three-month courses for this component, began on November 1.

Two important demonstration units were added to the garrison in this month. The medical demonstration detachment of seven officers and about one hundred enlisted men, assembled from five corps areas, arrived on the second. (293) On the twentieth, the 1st Battalion 83d Field Artillery arrived after an overland march from Camp Knox,

(289) Chamberlain, p. 18.
(290) Personnel Records Infantry School.
(291) Chamberlain p. 7.
(292) Annual Report Asst. Commandant, 1920-21, p. 1.
(293) Doughboy 1920-21.

Kentucky. (294)

Despite the hampering effect of the primitive environment in which it was carried on, the instructional work of the school proceeded steadily. Classes came and went. Courses were improved little by little as experience indicated where changes for the better could be made. By 1921 the school had acquired enough experience in the extensive fields of its work to justify a revision of what might be termed its character, Special Regulations No. 14. By this time also the school had undertaken the revision of several training documents and the preparation of others. (295) On January 31, 1921, the first class of national guard officers was graduated. Another class began a similar course on March 1, which terminated near the end of May. All the regular courses ended on June 30 after a two-week extension to compensate for the late opening of the classes in the fall of 1920. (296) In October the regular courses for 1921-22 began with 439 students enrolled. (297) An indication of the broadened character of the school's training program was the commandant's recommendation in August 1921 that in addition to the 29th Infantry at full war strength, there be stationed permanently at The Infantry School as demonstration units, a battalion of field artillery, a battalion of tanks, a company of engineers, an observation squadron, a medical demonstration unit, a pigeon loft and a balloon company. (298) However, the schedule of troop demonstrations had to be curtailed considerably. This setback in the training scheme was due to the reduction of the 29th Infantry to a two-battalion regiment, the disbandment of the medical demonstration detachment, and the withdrawal of the air service detachment. In 1921 the majority of the regular army students were newly commissioned and, according to the assistant commandant, Colonel Paul B. Malone, "knew little of the unwritten laws of the service." Nevertheless, they apparently entered into their studies wholeheartedly,

(294) Doughboy 1920-21.
(295) Annual Report Infantry School, 1920-21, p. 11.
(296) Annual Report Infantry School, 1920-21, p. 6.
(297) Annual Report Infantry School, 1921-22, p. 1.
(298) Annual Report Infantry School, 1920-21, pp. 17-18.

for Colonel Malone pays them high compliment in the school's annual report. "On the whole," says the colonel, "the conduct of the classes was excellent, the morale high, and the feeling that a great work for the army had been accomplished was general, almost universal." (299)

This evidence of student esprit appears to have been a circumstance of conspicuous brightness in an otherwise gloomy year. Besides the disheartening problems associated with the living conditions of Camp Benning, General Gordon was confronted with others of totally different character but of equally disturbing influences. One of these was the problem of adequate transportation service between Camp Benning and Columbus. The schedule of the one daily train which the Central of Georgia Railroad operated to and from the camp, was wholly unsuited to the needs of the majority of the garrison, which found itself interned during its hours of freedom from duties. This circumstance was regarded as a golden opportunity by a number of individuals who forthwith engaged in the business of transportation between the camp and the city. Soon scores of nondescript vehicles, operated by persons of no particular responsibility, were haphazardly engaged in carrying passengers between Camp Benning and Columbus. General Gordon desired the establishment of a reliable transportation system to displace the unregulated jitneys. Accordingly, negotiations were begun with the management of the Columbus street railways. An offer of the free use of the government's tracks to the camp was made to the company. This did not appear to be sufficient inducement, and the street railway company asked, in addition, that it be given a monopoly on all passenger and freight transportation, and a guarantee that the government would reimburse the company for any deficit incurred in operating the line. (300) The latter point could not be conceded and the negotiations fell through. With the street railway company eliminated, Columbus' interest in the camp transportation system seemed to be limited to a small circle of automobile dealers and

(299) Annual Report Infantry School 1920-21, p. 14.
(300) Gordon Feb. 24, 1921.

independent vehicle operators.. However, when a proposal to establish a regular passenger bus line between Camp Benning and Columbus was made by a Mr. Howard, of Atlanta, the subject at once became a matter of community concern. In May, 1921, a counterproposal offered by the automobile dealers of Columbus was laid before the Camp Activities Committee, a local citizens' organization. The Committee regarded Mr. Howard's proposal as the better one and recommended that General Gordon accept it. This he did, and the Howard Bus Line was given the exclusive automobile transportation privilege between the camp and the city. The contract did not become effective until August as General Gordon allowed the independent operators ninety days in which to withdraw their service. (301)

Another grave problem was the high rate of venereal diseases in the command. "Our venereal showing is positively the worst in the country," General Gordon wrote early in 1921. (302) Ever since he had taken command of Camp Benning, General Gordon had carried on a campaign against prostitution and its associate evil, bootlegging. The sinister ramifications of both were boundless and extended even into the camp itself. (303) Most of the sources were in the city, and in his endeavors to trace and eliminate their undesirable contacts with his command, General Gordon did not have the unanimous support of the local civilian community and its authorities. (304) "The vice campaign in Columbus is an uphill fight, as such a campaign is in every place," he said in a letter written in March 1921, "but I am sure that all the good people of the city are back of us." (305) Early in 1921 the city and county commissioners lent encouragement and practical aid to the campaign against venereal diseases by agreeing to erect and maintain in the city an isolation hospital for women afflicted with such diseases. (306) A little while later the governor of Alabama assured General Gordon of assistance in cleaning up the

(301) Gordon May 5, 1921.
(302) Gordon Feb. 24, 1921.
(303) Gordon Feb. 11, 1921; June 13, 1921.
(304) Gordon, June 13, 1921.
(305) Gordon March 26, 1921.

border line towns of Girard and Phenix City. (307) The campaign against bootlegging and the social evil uncovered many tender spots in the community and it became a topic of violent and partisan public discussion. Echoes of the fight were heard in Washington. General Farnsworth urged that the war against venereal diseases be carried on relentlessly. "I believe that the prevalence of that disease at Benning has done more to create in Washington an unfavorable impression as to Benning than has any other one thing", he said in a letter to General Gordon late in 1921. "Unfortunately this unfavorable impression has been among very high officers and War Department officials," he continued. "The future of the school very largely depends upon stamping out that disease, both at the camp and in Columbus." (308)

Another problem of no mean proportions was the constant readjustment of all activities which was made necessary by the growing shortage of enlisted personnel. This was particularly evident in 1921 following the promulgation of the War Department's order which permitted the discharge of any soldier who desired to leave the service. (309) This state of affairs was, of course, one which local authority had to accept with such grace as it could. However, in midsummer of 1921, General Gordon made emphatic protest against a proposed reduction of one-fourth of the force of nurses at Camp Benning. "If we had modern quarters for our families, officers and enlisted men," he said, "the necessity for hospital accommodations would be very much less."

Constant criticism by casual, but high-ranking, observers did little toward lightening the general's cares. "The personal appearance of the officers at Benning is the worst we have seen in the army," is a criticism transmitted to the harassed commandant by the Chief of Infantry. (310)

As a final, but by no means all-inclusive recital of the minor burdens borne by General Gordon, a list of some of

(307) Farnsworth July 7, 1921.
(308) Farnsworth Nov. 18, 1921.
(309) Gordon Feb. 8, 1921.
(310) Farnsworth Nov. 18, 1921.

the ill-starred events of this year will be illuminative. In March, during a firing exercise, a tank fired a six-pound shell into one of the officers' quarters in Block 23. Just a few days later an artillery shell fell on the railroad near Harp's Pond and a civilian workman had a narrow escape from death or injury. (311) In the same month a violent storm destroyed wire communication lines, unroofed buildings, moved some from their foundations, and damaged a great amount of subsistence and other supplies. (312) In May, a fete day, whose program included a ceremony, demonstrations, a baseball game, and a public reception, was broken up by another violent storm. (313) In June the local water supply dried up and it was necessary to improvise a temporary source of supply. (314) On October 27 President Harding and his party visited Camp Benning. While no untoward incident occurred, the plans for the presidential visit had to be curtailed to a great extent. (315) A gloomy outlook for the future was prohesied by General Farnsworth in this same month when he wrote, "It is becoming increasingly difficult to get personnel, money and materials for Benning. This is not because of any opposition to Benning, but because of the necessity for economy in the army. The economy is real economy and not simply talk about economy." (316) Only a year before General Gordon, viewing hopefully the immediate future, had written to General Farnsworth, "I feel, too, that we are meeting successfully the crisis that The Infantry School is now going through and that in another year the troubles of today will be forgotton in the improved conditions and in the school's success." (317) A vain hope, indeed, as it turned out to be, but at the end of 1921 General Gordon was regarding the school's prospects for the forthcoming year with optimism and courage unimpaired.

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(311) Gordon March 22, 1921.
(312) Gordon March 17, 1921.
(313) Gordon May 11, 1921.
(314) Gordon June 21, 1921.
(315) Gordon October 27, 1921.
(316) Farnsworth October 6, 1921.
(317) Gordon, November 26, 1920.

The Role of the Citizens of Columbus and the Vicinity in the Establishment and Retention of The Infantry School at Fort Benning.

The news of the War Department's decision to establish the Infantry School of Arms near Columbus was hailed with enthusiasm by the press, and spokesmen of civic organizations, and representative citizens of the town. Ever since early in 1917 Columbus had endeavored to induce the Government to locate one of the training camps in its vicinity. Almost simultaneously with the declaration of war with Germany in April, the Columbus Chamber of Commerce, the local newspapers and some other groups of public-spirited citizens inaugurated a movement to bring a cantonment to Columbus. (318)

About the middle of May, following the appearance of newspaper statements that the Southeastern Department would be one of the most important training areas, the Chamber of Commerce dispatched requests to Washington and to Major General Leonard Wood, then in command of the Southeastern Department, at Charleston, to have military representatives visit Columbus for the purpose of selecting a suitable camp site on ground adjacent to the city. (319) A few days later the Chamber of Commerce sent a committee to Charleston to interview General Wood and to present to him certain information about Columbus which it had compiled. (320) This delegation was the first of a dozen or more which were dispatched on similar errands to Washington, Atlanta, Charleston, and other places, and whose activities continued sporadically during the remainder of the year. The early efforts of the Chamber of Commerce to arouse the interest of the military authorities in the Columbus region seemed to be an auspicious opening to the campaign, for in June General Wood sent his aide-de-camp, Major Lee, to inspect and report upon the Columbus locality. Major Lee's favorable report upon the site (321) was highly

(318) Columbus Enquirer-Sun. April 4, 1917.
(319) (320) Columbus Ledger. May 17, 22, 24, 27, 28, 1917.
Columbus Enquirer-Sun. May 24, 26, 27, 29, 1917.
(321) Malone, p. 38.

encouraging. Enthusiasm ran high and a fund was raised by popular subscription to meet the expenses of a campaign of enlarged scope and increased vigor. (322) Committees inspected lands on all sides of the city. Later they obtained options on various tracts of land in the vicinity and as representatives of the many owners of the tracts, which together comprised enough land for a war-time cantonment, offered the entire lot to the government at a little more than a nominal price. (323) The city wanted the camp and the prosperity it would bring and was willing to make some little sacrifice to obtain it.

Bitter disappointment followed the announcement in mid-July that the War Department had completed its selection of cantonment sites, for the Columbus site was not one of them. The valiant efforts of the citizens' committee seemed to have resulted in dismal failure. Faint hope was revived in September when a suggestion that the city make a formal offer of a training camp site came from headquarters of the Southeastern Department (324) and again in December, when a committee went to Washington to seek official consideration of Columbus as a site for a proposed small-arms firing school. (325) So far as Columbus was concerned, nothing developed from either of these proposals and it looked as though the city's campaign had ended in defeat.

Columbus' plans and hopes lay dormant until summer of 1918 when news of the intended removal of the Infantry School of Arms from Fort Sill reached the city. Forthwith began a new period of activity to obtain consideration of the Columbus site. In June the Chamber of Commerce dispatched John A. Betjeman, a civil engineer, to Washington as its resident agent at the capital. Betjeman worked indefatigably and probably was a useful source of information to the general staff which was studying the recommendations of a board which had already acted favorably on the Columbus site. (326) On August 17, Betjeman advised the Chamber of Commerce of the general staff's approval of the

(322) Columbus Enquirer-Sun. June 19, 1917.
(323) Land for Artillery, etc. pp. 87-88, 115.
(324) Columbus Ledger, Oct. 5, 1917.
(325) Garrard.
(326) Malone pp.38-39.

plan to locate the Infantry School of Arms near Columbus. A temporary building site on the Macon Road just east of the city had already been selected, and when, in September, temporary construction work was started and officers of the school staff began to arrive, Columbus was ready to believe that at last it had obtained the camp which it had sought for more than a year. Early in October the first contingent of troops, members of the Infantry School of Arms detachment, arrived at the camp. (327) Soon after their arrival the camp was formally christened Camp Benning and the national flag was raised with great ceremony in the course of a civic celebration which was held to commemorate the official opening of the Infantry School of Arms and the realization of the city's desire. Miss Anna Caroline Benning, of Columbus, daughter of General Henry L. Benning, Confederate States Army, for whom the camp was named, was the guest of honor. (328) The designation of the permanent site of the Infantry School of Arms on the south side of Columbus, the authorization of construction there, the orders for condemnation and purchase of the 115,000 acres of land for the school area, and the arrival of a student class, were all regarded by Columbus with intense interest and gratification.

Early in December Columbus staged another public demonstration in celebration of the successful conclusion of its efforts to obtain an army camp. At this affair, Mr. Betjeman was acclaimed as a successful envoy who had accomplished the mission of obtaining that which the community had so long desired, and the city's gratitude was expressed by presenting to him a silver loving cup and a check for $2,500. (329)

The city's elation was short-lived, for within the month came the disconcerting news from Washington of the intention to abandon Camp Benning. In its hour of triumph, Columbus gazed upon defeat. The city saw that if the camp was to be retained, the fight would have to begin anew. Now,

(327) Columbus Ledger Oct. 7, 1918.
(328) Bradley.
(329) Land for Artillery, etc. p. 116.

however, there were new aspects to the situation. The armistice had been signed and the retention of Camp Benning for the continuation of the Infantry School of Arms was no longer a purely war-time enterprise. The citizens of Columbus had seemed to be unanimous in their desire to obtain a war-time cantonment, and the establishment of the Infantry School of Arms in the Columbus site apparently had caused universal satisfaction. But, when after the armistice, Camp Benning gave promise of appearing in a new role as part of the regular military establishment, an undercurrent of opposition, intangible at first, developed rapidly and soon became a formidable movement against its maintenance near Columbus. Some of the foremost antagonists to the camp were heads of local industrial concerns, who, it was said, feared that the proximity of a military post would affect wage scales and disturb local economic conditions. (330) Dissension replaced concord and partisan groups split the community into opposing combinations. The sharp differences of opinion held by the different parties soon found expression in a series of hearings on the subject which the Senate military affairs committee began early in 1919. Then the identity of some of the camp's most active opponents was established and the extent of their opposition revealed. Mr. Betjeman was again sent to Washington to represent the Chamber of Commerce in the struggle to save the new camp.

Columbus, no longer presenting a united front, but divided by partisanship, had entered a new contest, marked by acrimony and rancor, which was to decide the fate of Camp Benning. In the course of the long-drawn-out struggle, the friends of the camp had to make many concessions and sacrifices, not the least of which was the assumption of liability for damages resulting from the government's tentative occupation of some 17,000 acres of valuable land near the city. (331) Thirteen months after the new fight began, the partisans of Camp Benning emerged triumphant over their opponents, with victory firmly within their grasp.

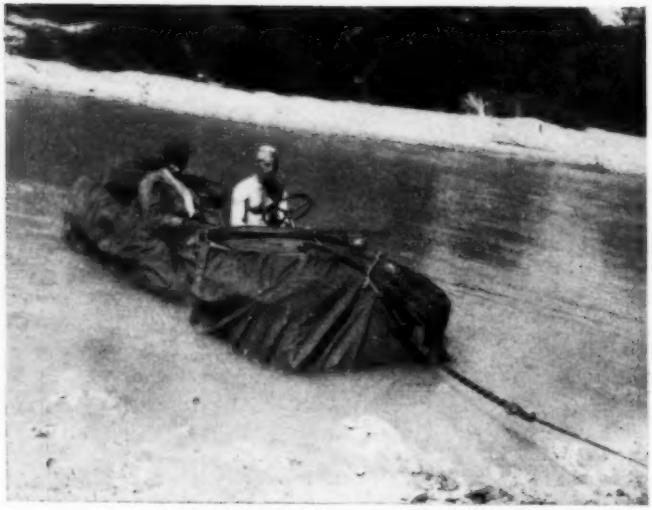
(330) Land for Artillery, etc. pp. 116, 184.
(331) Annual Report War Dept., 1919, p. 4134.

NOTES ON INFANTRY STREAM CROSSING EXPEDIENTS FOR ¼-TON TRUCKS

Among the experiments conducted by the Infantry Board in connection with the ¼-ton truck (Jeep) were a series of improvised means for crossing unfordable streams. The pictures which follow are examples of expedients which were used. Materials used are readily available to Infantry units in the field.

A cable ferry—Two 2½-ton trucks on the near bank. Bumpers against trees provide stability. Winch cables are pulled across the stream by a man who has crossed carrying a light line. Cables are fastened to stout trees on the far bank.

Truck suspended by snatch blocks and tow chains from 1½ or 2½-ton trucks equipped with power winch. Blocks are placed over cables attached to trees. Cables are then tightened only sufficiently to lift vehicle off the ground. The more slack left the better, so as not to set up too much strain in the cable. The truck can be easily pulled across the stream by four men using a light line.



Wet down the stream bank to make it slick before placing the canvas top of a 2½-ton truck on the ground. Drive on the ¼-ton truck, wrap it up and launch it by using the wet clay bank as a skid. The truck may be pushed across a shallow stream or towed across by cable from power winch. If stream is not over 100 feet in width, cable may be carried through a block on the far bank and truck pulled across from the near bank. The front wheels are beached, canvas top unlashed and truck driven out.

Double outrigger pontons made from lashed saplings and canvas tops of 2½-ton trucks. Size of ponton frame is 1½′ x 3′ x 11′. Truck is launched by driving into water, pulled or pushed across stream and driven out on bank. To attach to next vehicle, untie bumper lashings, slip out front pole, drive out truck, pull frame back to near shore and attach next vehicle.

Truck with double outrigger pontons, each made of 5 9x12 inner tubes from 2½-ton trucks, one additional tube in front for launching buoyancy. Tubes inflated by pump. Ridge poles and tent poles were used in this experiment but saplings could have been substituted. Note wooden paddles attached to rear wheels. These were unsatisfactory as vehicle submerged below axle line causing as much pull as push. A great advantage of this type of inner tube flotation is that it gives maximum clearance, making self launching and beaching easy.